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APPENDIX VII
SEVIER RIVER BASIN FLOODS
SEVIER RIVER BASIN, UTAH



United States Department of Agriculture

Economic Research Service ● Forest Service ● Soil Conservation Service

September 1971

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SEVIER RIVER BASIN FLOODS

1852 - 1967

Compiled by Max R. Keetch



Manti City Flood August 1, 1901. (Photo courtesy of
Lloyd Tuttle, Manti, Utah.)

United States Department of Agriculture
Economic Research Service
Forest Service
Soil Conservation Service

Salt Lake City, Utah

September 1971

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A B S T R A C T

This chronology of Sevier River Basin floods extends from 1852 to 1967.

Most common and destructive are dry mantle floods, which flow as a muddy mortar-like substance containing 40 to 55 percent water. Hundreds of tons of protective topsoil are removed from watershed lands, debris and boulders are picked up as the flow travels down steep stream channel gradients, and then the flood is debouched into communities and on to productive cropland.

Floods are related to one or more of three principal factors:

(a) Convective thunderstorms which produce violent, intensive precipitation; (b) physiography of abrupt relief creating steep stream gradients and intensifying cloudburst storms; and (c) the depletion of vegetation from watersheds by excessive grazing.

Several previous chronologies have been written and are included in "Sources of Flood Data" page 123. Principal sources of the historical information in this report are those previously published chronologies, newspaper files, and other historical records.

The flood chronology is organized both in time and by location. Instructions on its use are found at the beginning of the chronology on page 22.

Notes on the floods taken from the context of newspaper articles are rewritten in some cases to make their meaning more clear. One source document listed many floods and classified them as "light," "moderate," and "severe." As these terms were not defined, they were entered in the chronology the same way.

Quantitative information such as damage estimates and peak flows are referenced by number back to the source document. Peak flows from sources such as, "Magnitude and Frequency of Floods in the United States, USGS Water Supply Paper 1684," are probably based on measurement; some others, however, are questionable estimations made by unknown authors.

I N T R O D U C T I O N

PURPOSE OF REPORT

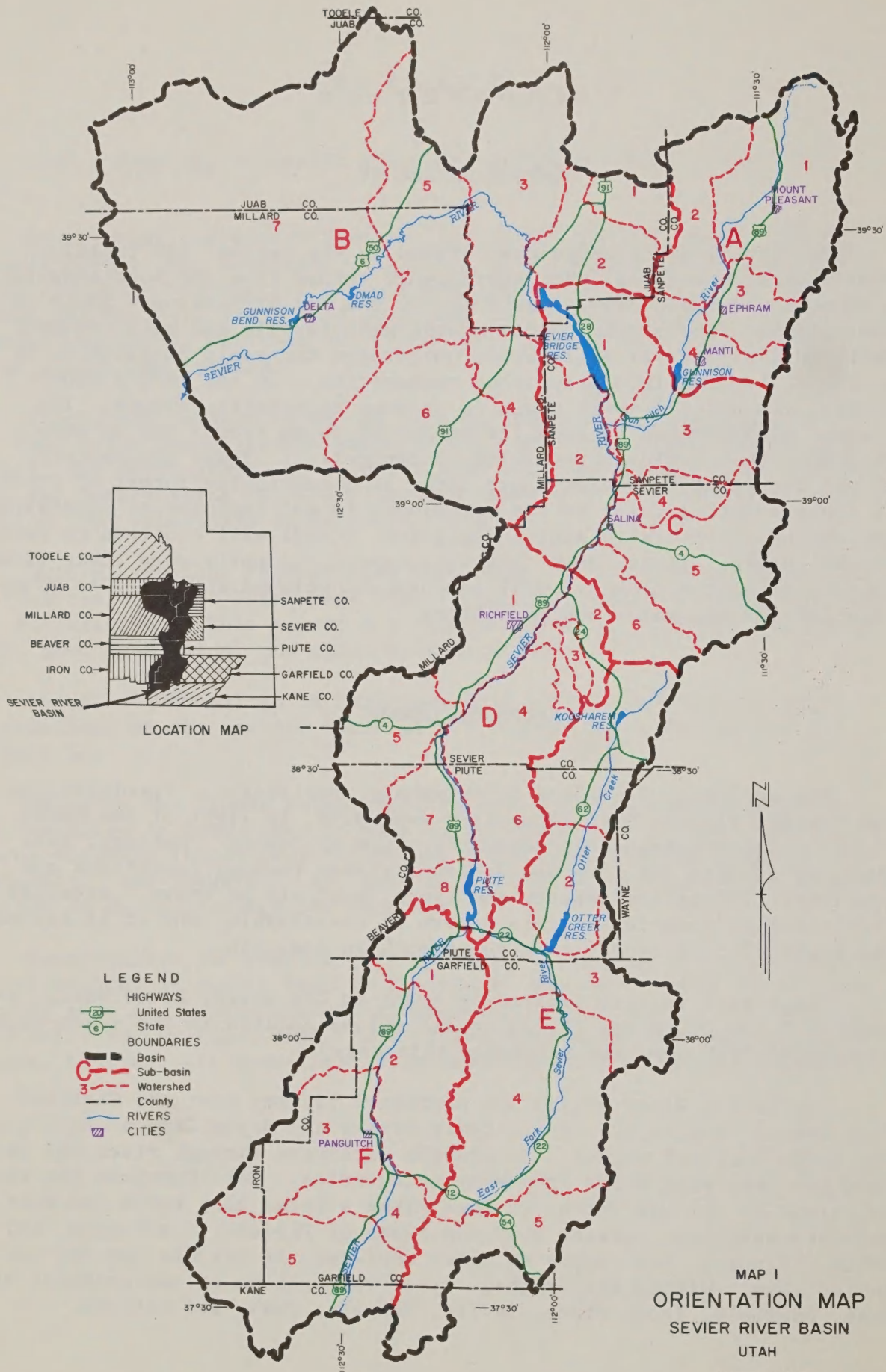
The Sevier River Basin was settled in the period 1849 to 1870; communities were established where water issued from the mountains in perennial streams suitable for domestic use and irrigation. Soils on the alluvial fans at the canyon mouths were fertile and well drained. Their suitability for agriculture encouraged the rapid development of small settlements into prosperous communities. In the 1880's many canyons above these towns began to produce devastating floods. The alarmed people began to look for causes of these floods and to seek ways that they could be prevented or controlled. Today the majority of the people still reside where there is a continuing threat of floods. If the protective cover on the watersheds is not improved or maintained, and needed structural measures installed, floods will continue to menace the basin. It is hoped that this report, in portraying these floods and their related aspects, will encourage continued endeavors to maintain and improve watershed conditions.

SCOPE OF REPORT

The analysis of a flood is extremely complicated. Precipitation and weather records must be closely evaluated, in light of the conditions on the watershed receiving the storm or runoff. Geology, soil type, soil depth and moisture content, stream channel conditions and gradients, vegetation density and types, must all be known. Detailed historical information of this nature is unavailable, and it is beyond the scope of this report to attempt such an analysis.

The report is also limited in scope to the Sevier River Basin; an area of 5,200,000 acres (8,125 square miles) located in the south-central portion of Utah (see map following this page).

The Sevier River begins its northward journey near the Garfield-Kane County line in the scenic Cedar Breaks and Bryce Canyon country of the Dixie National Forest. It travels northward through Piute and Sevier Counties receiving water from many tributaries. Near Gunnison the river is joined by the San Pitch; it then makes a large loop north and west and then southwest passing near the towns of Fayette, Leamington, and Delta. Finally, its supply of water depleted, it reaches the dry bed of Sevier Lake. Within the drainage area are portions of the counties of Kane, Garfield, Iron, Piute, Sevier, Sanpete, Juab, and Millard.



ACKNOWLEDGEMENTS

This report was prepared as part of the Sevier River Basin Investigation, a U. S. Department of Agriculture River Basin Type IV Study, conducted by the Soil Conservation Service, Economic Research Service, and Forest Service cooperating with the State of Utah. The Deseret News of Salt Lake City was very helpful in making available microfilm files of early newspapers. The Utah State Historical Society provided assistance. People, both within Government agencies and as private individuals, contributed a great deal of information. This help is gratefully acknowledged.

FLOODS AND THEIR CAUSES

FLOODS DEFINED

The dictionary defines a flood as "an unusually abundant flow of water in a stream rising and overflowing land not commonly covered with water." Such a definition does not adequately describe the mud, boulder and debris-laden flows, which have produced the more destructive floods. These flows are a result of a very high intensity rainfall, produced by a convective thunderstorm, falling on soil much faster than it can be absorbed and, therefore, producing rapid surface runoff. Such flows are referred to as dry mantle floods.

Such a flood occurred on July 24, 1946, at Mount Pleasant and is described in the flood report in detail. (1/)

"Near the canyon mouth the flood was first observed as a forerunning wave of fairly clear water which rapidly changed to the mud-flow type of flood. The force of this mortarlike mud with its accompanying load of rocks and logs was such that boulders up to 10 feet in diameter were moved and streambanks heavily eroded.

"The velocity of the flood wave on a 4 percent slope was about that of the speed of a running man or about 12 miles per hour. About 180 acre-feet of productive topsoil was removed from the headwaters of the stream and deposited in the valley. It was concluded that the mud flow may have been 25 to 60 percent sediment by volume when flooding the town and adjoining farm land. Debris ranged up to 4 feet in depth in the inundated districts of the city. Mud invaded homes and ruined furniture, interior decorations and food stores. Foot and vehicle bridges were washed out. Stores and business houses were clogged with mud and merchandise damaged.

"Chickens, pigs, and turkeys were either swept downstream or smothered in their pens. Parts of the city domestic water supply lines above town were washed out. Other sections were contaminated and typhoid inoculations were made necessary."

The operation of power facilities were interrupted, gardens and lawns were destroyed. Crops on agricultural lands were destroyed and soil productivity reduced, railroad yards were inundated (Figure 2).



Figure 2 - Flood debris resulting from the July 24, 1946, Mt. Pleasant Flood. (Forest Service photo)

Rapid snowmelt in the spring, sometimes accelerated by rainfall, has occasionally produced floods. Since soils at this time of year are usually saturated with water, spring floods under these conditions are referred to as wet mantle floods. Such flows are characterized by sediment carried in suspension and not as a mud rock flow.

In the Panguitch, Hatch, and Circleville areas, the Sevier River has often exceeded its banks, but most land inundated is meadowland and damages are largely confined to the stream channel and contiguous areas (Figure 3).



Figure 3 - Inundation of meadowlands north of Panguitch, relatively minor damage results from such flooding. Spring 1967. (Forest Service photo)

THE IMPORTANCE OF THE PROBLEM

Floods have directly damaged crops, homes, roads, and other improvements. Losses that can be expressed as a dollar value have been great. Even greater than these direct economic losses are the social and resource damages caused by these floods. Farmlands have been taken from production due to deposits of sediment and rubble. Statements in newspaper articles report that floods from Tids Canyon near Fountain Green became so numerous and destructive that in 1924 some farms south of the town were abandoned.

Dyrenge reports on the flood impact on Manti City:

"Because of the abused watersheds, floods became common. Manti was hit first. The soil washed from the side hills, gullies were cut in the slopes, canyon bottoms were gutted out, diversion structures in

the valleys were torn away and once valuable farms were covered with cobble rock and debris. Floods were repeaters.

"Although the population did not know the underlying cause of the condition that had come upon them they became discouraged and many families pulled their stakes and left for greener fields where they might start anew away from the flood menace." (2/)

Watershed conditions have improved in many cases from what they once were. Some communities are now protected by expensive debris basins and other structures. It would be very much in error to complacently view floods in the Sevier River Basin as part of the historical record, no longer of concern to us. Because of geological and climatic conditions, some watersheds will continue to produce floods; other watersheds are still in an unsatisfactory condition and in need of treatment and better management.

Some people advocate increased grazing on our watersheds. They reason that less vegetation on the watershed will result in more water available for downstream use. Such a view, without regard to the consequences of depleting the protective watershed cover, indicates a lack of understanding of the soil, water, and vegetation relationships. Communities are still located in the paths of flood-producing streams, and when weather factors combine with unstable watershed conditions destructive floods can be expected. Future flood prevention will require a better understanding of watershed hydrology along with action for improved resource protection and management.

THE RELATION OF FLOODS TO WEATHER

The Sevier River Basin is influenced by two storm systems. In the winter, storms come from the Gulf of Alaska or the Pacific Coast. Such storms are characterized by rather intensive low pressure, often resulting in a large total precipitation but spread over a protracted period. These storms saturate the soil mantle but do not produce the high intensity rainfalls resulting in dry mantle floods.

Summer convective thunderstorms, which derive their moisture from the Gulf of Mexico also gather evaporative moisture from the water, soil and plant surfaces as they push inland into Utah. Primarily during July and August, intense solar heating of the atmospheric layers near the earth's surface uplifts the moist air mass. As it rises, it cools and the moisture condenses to form clouds. As the clouds begin to form, updraft currents become more violent and descending cool air is replaced more and more rapidly by ascending, moisture laden warm air. These currents are often strong enough to prevent the cloud droplets from reaching

the ground and the drops of rain or hail reach large size before finally being released from the cloud.

If such a convective storm should be suddenly lifted several thousand feet high over a mountain range, the entire process is intensified because of the additional cooling taking place in a shorter period of time. This rapid dissipation of heat energy combined with condensation of air moisture produces very violent cloudbursts of great intensity. One such rainfall near Farmington, Utah, produced a five-minute intensity of rain of nearly nine inches per hour. (3/) Soils and vegetation must be in near optimum condition to prevent a rapid surface runoff of water under such intense storms. These summer thunderstorms, combined with impaired watershed conditions, have produced the more destructive floods.

PHYSIOGRAPHIC AND GEOLOGICAL FEATURES

The Sevier River drainage is situated both within the Colorado Plateaus and the Basin and Range Province. The elevational differences of the area are extreme with the lofty Tushar Mountains reaching elevations of over 12,000 feet, almost three times as high above sea level as the desert-like basin floor at near 4,470 feet. The extremes in elevation result in great vegetative and ecological changes. The higher elevations are sub-alpine with abundant precipitation and well vegetated. The lower elevations are desert or semi-desert in character with low rainfall and sparse shrubby vegetation.

Cyclonic storms sweeping across the Great American Desert are milked of their moisture, and summer convective thunderstorms increase in intensity and violence as they are swept up and over these lofty mountains and plateaus which typify most of the Sevier River Basin.

The transition from the valley floors to the tops of the high plateaus is very steep. Many of the stream gradients exceed a 1,000 foot rise in elevation per mile. Slopes exceed 70 percent on many of the canyon sides and the steeper portions of watersheds. Under these conditions, soils require a maximum of protection to be stable. Streams once started to erode on these steep gradients are extremely difficult to stabilize or control.

From north to south principal geologic features include:

The Wasatch Plateau extending from Salina Canyon north along the east side of Sanpete Valley. This plateau is composed almost entirely of sandstones, shales, and limestones. Streams originate near 10,000 feet in elevation and reach the valley floor at about 5,700 feet in four

or five miles. Because of these steep gradients and past unsatisfactory watershed conditions, floods have been especially prevalent from these canyons. Most creeks draining toward Sanpete Valley are deeply eroded, some 20 to 30 feet into ancient alluvium.

North of the town of Gunnison and extending northward on the west side of Sanpete Valley are the Sanpitch Mountains, more commonly known as the Gunnison Plateau. Soils are but poorly protected, and the numerous cliffs and bare rock outcrops have produced numerous floods in such canyons as Tids, Maple, Wales, Pigeon Creek, Chicken Creek and others.

Extending from the Scipio-Round Valley area northeast to the Sevier River is the Valley Mountains. Floods from canyons on this structure have been quite infrequent and have done little downstream damage.

West of Richfield, Aurora, and Elsinore all in the Sevier Valley, is the Pavant Range which extends north from Clear Creek to Round Valley. The southern end of the range reaches the northern contact of volcanic rocks characteristic of the Tushar Mountains. Latitic flows, breccias, and rhyolitic tuff is common from Richfield and Corn Creek south. From Richfield north are found sedimentary rocks, sandstones, shales, and limestones; the canyons here are raw and rugged. Cottonwood, Flat, Willow, Cedar Ridge, and almost all other canyons in this area produce frequent floods.

Northwest of the Pavant Range, between the towns of Scipio and Delta, is the Canyon Range. This range, composed of sedimentary rocks, reaches over 9,000 feet high with Oak Creek and Fool Creek being the only perennial streams. Oak Creek has often flooded Oak City and surrounding farm lands.

South of the Pavant Range the Tushar Mountains extend from Clear Creek south to the Fremont Pass area in Dog Valley. The highest peak is 12,173 feet. Despite this elevation, the range is only 17 miles in width. The mountain is mostly volcanic breccias and flows. Clear Creek and streams west of Marysvale have produced both wet and dry mantle floods.

East across Sevier Valley from the Pavant Range and the Tushar Mountains is the Sevier Plateau. This plateau extends from east of Panguitch north until it becomes a series of low hills near Sigurd. Throughout its 70 mile length, the Sevier Plateau faces the Sevier Valley in a great eroded fault scarp. In the vicinity of Monroe, this scarp has 5,700 feet of relief, and streams traverse this elevation in a distance of 5 miles. The formation is mostly composed of volcanic rocks. Monroe Creek, Thompson Creek, Mill Canyon, Water Canyon, Dry Canyon, Manning Creek, and Dry Creek and others have produced frequent floods.

To the east of this structure is located the Fish Lake Plateau. Some of the headwaters of Salina Creek are located here and have produced floods; however, most of the drainage is to the Fremont River and out of the basin.

Due south of the Fish Lake Plateau is the Awapa Plateau, which is locally called Parker Mountain. It has some steep drainages into Otter Creek to the west but there are no recorded floods from this area.

South of Parker Mountain and southeast of Antimony is the Aquarius Plateau. Sevier Basin floods have been produced in Antimony Creek and Dry Wash from this structure, but most waters find their way into the Colorado River.

In the southeast corner of the basin is located the Paunsaugunt Plateau. The plateau is surrounded by pink cliffs, of which Bryce Canyon National Park is a feature. Floods have frequently originated on these erosional features and have been recorded from Red Canyon and others on the west side of the plateau. Floods are frequent in Tropic Canyon and other nearby canyons, which are tributary to the Paria River. (This area is considered within the river basin because it receives water from the East Fork of Sevier River.)

West across the narrow valley of the main fork of the Sevier River, west of Panguitch and Hatch, is the Markagunt Plateau. The Markagunt Plateau is the source of the Sevier River and is the heaviest water yielding area. There has been some flooding of Panguitch Creek and other drainages, but most floods are of the wet mantle type and damages have been light.

WATERSHED CONDITIONS PRIOR TO INTENSIVE GRAZING USE

There is little information concerning watershed conditions prior to the intensive grazing use of 1880 to 1910. Diaries and journals of early explorers and settlers devote very little space to vegetative and stream conditions. They were far more occupied by other factors which were a threat to their existence or of economic concern to them. Some information available was written from memory by early explorers and settlers in the basin.

The Sevier area was visited by Father Escalante in 1776. He traveled through the basin in the vicinity of Levan, Scipio, Mills, and Holden, then south passing near Sevier Lake. Where Escalante came upon the Sevier River, believed to be just east of Mills, one translation of his journal reads "and we stopped in a valley of good pasturage which we named the valley of Santa Isabel." (4/) In passing on south from

this valley near Holden, Deseret, and Sevier Lake, he describes the area as "Monotonous gray sage with occasional junipers." They called the lower Sevier Valley, "Valle Salado," the name indicating the barren nature of the country with the land encrusted with alkali and salt.

Another person to leave an account of the Sevier Basin was Jedediah Smith in 1825. He reached the Sevier River south of Levan, followed up the Sevier to Clear Creek and out of the basin. He mentions low sage covered hills and good grazing in the bottomlands much as we have today. (5/)

Portions of the Journal of Orville C. Pratt read:

"Tuesday, September 26, 1848. Camped today on the Sevier River (He had come from Fishlake, then called Wasatch Lake, over Niotche and down Salina Creek so his camp must have been near present Salina.) after marching about 10 miles and found the grass very good . . . The men caught some of the finest trout here that I ever saw . . . some of them weighing at least 4 lbs. They have the same color as the trout of western New York with red specks, but the color of the spots on the trout from the Sevier is black and instead of being distributed on the sides in parallel rows they are found spread all over the surface in an irregular manner. The valley of the Sevier, where we struck it, is the finest I have seen since leaving the United States.

"Wednesday, September 27, 1848 . . . Grass was so good and the water of the finest kind I ever saw. This valley of the Sevier is truly the loveliest spot, all things considered, my eyes ever looked upon. Some day or other, and that not distant, it will swarm with hundreds of our enterprising countrymen, as in truth it is, the garden of the great basin of the California Mtns.

"Friday, September 29, 1848 . . . Our trail lay up the Sevier River and we passed a delightful country. I never saw better grass for animals, even in the U. S. and as for water, no purer or colder can be found anywhere in the world. Scarcity of timber is the only want. Difficult in many places to get enough wood for fires." (6/)

Lt. R. L. Hoxie of Wheeler's mapping expedition kept a diary of his travels through the basin. September 29, 1872, he crossed from Beaver to Panguitch through Bear Valley. He speaks of abundant beaver dams, grass, and trout the length of the creek. October 2, 1867, he traveled to the East Fork west of Bryce Canyon. He estimated the water flow as 5 second feet (c.f.s.) and speaks of the abundant grass in Johns Valley and the trout in the stream. (7/)

Mr. C. A. Mattsson wrote in his recollections of the period 1885-1890. "Even as young as I was, the good forage conditions at that time made a lasting impression on my mind. The vegetation was so dense

and thrifty that we had difficulty in walking through it.

"As a boy, I also have a vivid recollection of the good forage conditions that existed on the hills just east of the Salina City Cemetery. One hill near the cemetery area, because of the dense and thrifty grass on this hill, it was known as Grass Hill. I also have a vivid picture of forage conditions on the valley range west of Salina. Much of this range at that time had a good cover of palatable grasses." (8/)

In 1853, Mr. E. F. Beale, Superintendent of Indian Affairs in California, made an expedition through the basin. His scribe Gwinn Harris Heap wrote in July 30, 1853, of the Sevier River. Crossing the Sevier River near where it is joined by Salina Creek he described the river as "12 yards in breadth and from three to four feet deep."

On July 31, speaking of the Richfield-Monroe area. "This valley lies north and south, and surpassed in beauty and fertility anything we had yet seen. It is about thirty miles in length by four in breadth, surrounded by mountains, down whose sides trickled numberless cool and limpid brooks, fringed with willows and cottonwoods. Sevier River flows through its center, and it abounds its entire length in rich pasturage. The mountains which enclosed it were clothed, from summit to base, with oak and pines." (9/)

MAN'S ABUSE OF THE WATERSHEDS AND ITS AFTERMATH

Man and his use of the natural resources has been an important factor in relation to floods. Considerable controversy has raged over the degree of man's influence on our watersheds. Some have held that geological evidence indicates that floods have always occurred and point to the alluvial fans, canyons, and geological features of the basin for their evidence; maintaining that man has not influenced the occurrence or destructiveness of floods. Others would lay the entire flood problem at the feet of those who utilize forage on our watersheds; taking the other extreme position that all floods and high water are due to over use of the range. Neither extreme view seems completely valid, floods are a part of the natural erosive process, yet this process has been accelerated by man's activities. This change has produced floods that have increased in both frequency and severity since man began to modify the vegetation on the watersheds.

Vegetation influences flood flows in several ways. It provides physical protection to soil by sheltering it from the impact of rain and hail. It aids in physically impeding small rivulets of water and also catches some water on its foilage where it is evaporated without ever reaching a stream channel. Vegetation provides litter for the soil surface

and humus in the soil. Litter from vegetation provides a physical barrier for overland flows, protection from storm impact, and itself absorbs and holds moisture. Humus in the soil greatly increases its absorption and retention qualities. Soils high in humus also are conducive to soil organisms which increase its porosity. Sod-forming and fibrous rooted plants bind soil in place and their decomposing roots provide passageways for water to enter the soil mantle.

Early settlers set out to cultivate the valleys and to utilize the vegetation on the hillsides which were too steep to farm. First priority was given to use of the timber resources to provide shelter for the settlers, and usually, shortly after settlement of an area, a sawmill was established. By 1890, there was a sawmill or a mill producing railroad ties in nearly every canyon. Erosion resulted from skidding logs long distances down steep hillsides, improper construction of wagon roads, and other factors. However, it is probable that erosion from these sources was quite limited and local in extent.

More destructive than logging were the frequent fires in paving the way for future floods. Particularly during the drought years, near 1900, brief mention of fire in newspaper articles and other early historical records lead to the belief that fires were widespread. Present day evidence of charred stumps and even-aged timber stands scattered throughout the basin support this belief. Many fires were intentionally set. Some stockmen set fires to improve the range. After a fire, herding was easier and the young grasses and emerging vegetation were very palatable. Brushy cover and thick timber near sheep bed grounds were often ignited to destroy cover for coyotes and other predators.

Mr. Carl A. Mattsson in speaking of the Fishlake National Forest said:

"The timbered areas were being burned by hunters, careless stockmen, campers, and others. These fires were so extensive that at the time of the creation of the Fishlake Forest in 1905 and 1906 approximately one-fourth of the timbered area had been burned over." (10/)

Ephraim A. Madsen gives an account of a fire above Mt. Pleasant.

"On our way home we seen (sic) a timber sidehill on fire. We met a man and asked how it got on fire, he said he works here at the Eccles sawmill. They burn out the next canyon, the sawtimber won't burn. Next year they move in. This free choice of timber was very destructive." (11/)

Early settlers recognized that abundant native feed on the surrounding hillsides provided excellent pasture for their livestock. In these early communities every family had a few animals; milk cows, cattle, horses, sheep, or goats for their own use. In summertime, these animals were often organized into community herds and turned over to

young boys who would drive them from the communities in the morning and bring them back in the evening. Livestock production soon came to be recognized as one of the more profitable enterprises available in the newly settled area, and settlers rapidly expanded their herds.

Cattle were first to expand in numbers, but sheep were soon found to be more profitable. Cattle required hay or grass bottomlands in order to winter; sheep could graze on public range year round. Large bands of sheep wintered on the desert ranges and grazed towards the tops of the mountains following melting snow and reversing the process in fall. Sheep did not require as much or as well distributed water as cattle, and there was a good market for both wool and mutton. In the competition for range, sheep had the advantage over cattle. Sheep could obtain adequate forage from a range already fully stocked with cattle but, on the other hand, cattle could find little feed after an area was heavily grazed by sheep.

This era and the effect of the heavy grazing on the vegetative and the watershed resources is well documented in historical records. Mr. Laurtiz Nielson of Ephraim gives a very vivid account of grazing and its results in Ephraim Canyon.

"I was born on the 26th of February in 1875. The first time I remember of being on the mountain was with my brother-in-law, Hyrum Thorpe. At this time Old Barney Stevenson had a dairy on Bluebell Flat where he made cheese. 'Kanore Tom' Lund also had a sawmill at this site at that time. I was just a good-sized kid of about ten years old. This was before the big flood of 1889.

"As I recall, in 1889 there was a big summer flood which gutted out the streambed so that it had steep banks, and it was no longer possible to travel the road to the side of the creek bed. In fact, at this time that old road was almost completely demolished . . .

"Up until 1885 grazing had been very light because of trouble with the Indians. Anything that strayed very far up onto the hills was often stolen. At this time, the city had a regulation that you might not bed sheep down on a slope going into the creek because of danger from pollution. People used the creek water for culinary purposes. It was, however, all right to herd them on the slopes. It was about this time people began to put sheep on the mountain and numbers increased very rapidly up until about 1902.

"In 1902 there were seven herds in what is the drainage of Willow Creek Canyon . . . Both sheep and cattle would go on the mountain in April with the sheep being on a little earlier. After lambing, or in early summer, June and July, they would move to the high elevations, but they remained in Willow Creek for probably two months, some more. They

came back in the fall and as I mentioned often stayed until snow drove them off.

"There was one big shearing corral in the mouth of Willow Creek, put up by the Lunds and "Chicken Peter" Peterson of Manti. Other corrals were in New Canyon and in Pigeon Creek. The one in New Canyon was located at what is now known as "Pete Bishop's Trail." It is estimated that the one in New Canyon would shear about 100,000 sheep. Besides these, there were shearing corrals in other places. There was a big one in the forks of Manti Canyon which operated longer than the others. At this time, women of the town did a good part of the shearing.

"In those days, it was possible to go almost anywhere with a horse and cart. There were no steep-banked ravines as we see today. I remember Ephraim Creek contained lots of trout until the first big floods, when they were killed out. In fact I caught many fish as a boy in this stream.

"I remember in the peak of the sheep grazing, sitting, and looking through the aspen and there was not a green leaf or sprig of any kind as high as the sheep could reach and the ground was absolutely bare. They ate everything that was green." (12/)

In 1910, Mr. Robert V. R. Reynolds was sent by the Forest Service to investigate the causes of floods near Manti and Ephraim. The following is taken from his report.

"The range cattle business was at its climax in 1880 when the sheep business first began to take foothold in the west. From the first, sheep were more profitable than cattle for those who were able to secure themselves enough summer range, the long struggle between the sheep interests and the cattlemen, and the final defeat of the latter is a matter of history. It is also well known that throughout the fight for control of the summer range, tactics were employed by both sides to oust their adversaries, which caused great damage to the range. Flocks were handled close bunched and moved over far more country than was necessary, both in bedding and in feeding and in maneuvering to obtain control of the choice areas. Hundreds of fires were set under the mistaken idea of "improving the range," and to burn out dense areas of brush in order that the sheep might penetrate them. In the fall, upon leaving the summer range it was a custom to set fires on the way out. In this way much green timber was also killed or destroyed.

"As the contest became more severe between the sheepmen and cattlemen and between rival sheepmen, the carrying capacity of the range rapidly diminished, and all the more travel on the part of the grazing stock became necessary in order to secure enough feed.

"The result of these conditions was that between 1888 and 1905 the Wasatch range from Thistle to Salina was a vast dust bed, grazed, trampled, and burned to the utmost. The timber cover was reduced, the brush thinned, the weeds and grass cropped out by the roots, and such sod as existed was broken and worn. The basins at the heads of the canyons suffered the most damage, relatively, because they contained the best feed for sheep on account of their altitude and greater precipitation both in winter and summer. They are also less broken in topography and more easily accessible. These high mountain pastures therefore received more of the abuse and have been proportionately longer in recovering from its effects. (13/)

Pigs were even utilized to obtain forage which must be rooted out of the ground.

"In 1894, a neighbor, Geo. Seeley, took me acrost (sic) this 10,000 ft. mtn. (above Mt. Pleasant) to round up a herd of pigs. 12 miles from home Geo. said this valley is called Pricketts Flats, it was here his father and McCarther turned a hurd of pigs loose to summer. George's Father said the sheep had eate (sic) all the grass. The pigs would live fat on the roots. This valley now is covered by the Cleveland Lake.

"We rode to a sheep camp for dinner, there was a mad hurder, he had just shot 4 pigs. He knew Seeley. He said drag those S. B. down in the canyon and get the hell out of her (sic)." (11/)

E. W. Crane said: "In the early settlement of Salina there were few cattle and sheep and what they did raise they did not ship out of here. Up until 1889, and before, cattle and sheep did not go on the high range, and the hills were covered with grass. Large companies came in during 1889 to 1910 and monopolized the range and the feed. They were here for the money, carring little for the value of the range. The grass was all stomped out and eaten by the large herds of sheep belonging to these companies; besides, poisonous plants had taken the place of the feed that previously had grown so well." (14/)

William M. Hurst wrote on October 19, 1935, about areas near Panguitch:

"During the past 25 years, while connected with the Forest Service, I can call to mind many places which have become seriously eroded and made extremely impassable even by horseback. The most destructive places recalled are Long Valley Wash, John Cameron Draw, Spring Hollow on Hatch Mountain, Pole Canyon, Three Mile Creek, and Sandy Creek . . . Today (1935) these washes are as much as 20 feet deep and are impassable even by footmen. These facts are conclusive that overgrazing domestic livestock is responsible for the eroded condition and not the grazing of game animals." (15/)

Benjamin Cameron wrote on October 16, 1935:

"I came to Panguitch in the year of 1881, at the age of 23, ten years after the first permanent settlers. My recollection of the range is that it was practically a solid mat of grass, together with sage and browse plants . . . It was common in those days to make hay from the native grasses by harvesting the stand from the draws in the vicinity of Mamouth and Duck Creek." (15/)

Ira W. Hatch wrote on October 16, 1935:

"I came to Panguitch in the spring of 1871 at the age of 18 years and I was among the first permanent settlers of the valley. My recollection of range conditions at that time lead (me) to believe that the ground cover of grasses and forage plants was from two to three times as great as at the present time . . . Washes and floods and other signs of erosion were unnoticeable . . . Sagebrush has always been common in this vicinity, especially on the southern exposures, though I believe it was not as dense nor as high as at present, nor did it cover as much of the west and northern exposures as it does now." (15/)

Today ranges and watershed conditions have started to improve. We have lost part of our basic resource, the soil, and therefore it will be many decades before watersheds will again be in good condition. Watersheds will never be as they were before this era of intensive grazing. Most streams in the basin are brown in color due to their heavy load of silt. They are contaminated, flow through unstable channels, and are a far cry from Orville C. Pratt's statement of the Sevier River, "As for water, no purer or colder can be found anywhere in the world." Some stream flows are now flashy carrying water only after rainfall or spring snowmelt and dry the rest of the year.

Due to impaired forage production, livestockmen have lost a valuable resource. Reductions in grazing use have been made since the ranges were abused and further reductions will be necessary on some areas to restore watersheds to their desired condition.

Instead of endeavoring to maximize incomes each year with a disregard of the heritage of impaired resources being left to future generations, many livestockmen are now sponsoring and supporting programs lending to watershed improvement. They recognize that mountain rangelands can be grazed by well-managed and distributed livestock without impairment of grazing and watershed values. A better understanding of hydrologic relationships is encouraging conservation efforts producing lasting benefits.

REFERENCES

- (1/) Appendix No. 5, Mount Pleasant Flood of July 24, 1946. "Flood Control Survey Report" Sevier Lake Watershed, Utah 1950. Published by United States Department of Agriculture and prepared by the U. S. Forest Service and Soil Conservation Service.
- (2/) "History of the Events Leading to the Creation of the Manti National Forest," as told by Ivan L. Dyreng. (Unpublished document Forest Service files.)
- (3/) "Mountain Water" by A. Russell Croft and Reed W. Bailey, U. S. Forest Service, May 1964.
- (4/) "Father Escalante's Journal 1776-77" by Herbert S. Auerbach. Utah State Historical Quarterly, Volume II, 1943.
- (5/) "The Route of Jedediah S. Smith in 1826 from the Great Salt Lake to the Colorado River," by A. M. Woodbury, Park Naturalist, Zion National Park.
- (6/) Exerpts from "Old Spanish Trail" by LeRoy R. Hafen and Ann H. Hafen. Pages 59-62, Arthur H. Clark Co., Glendale, California, 1954.
- (7/) Diaries of Lt. R. L. Hoxie of Wheeler's Expedition September 27 to December 6, 1872, and August 27 to December 3, 1873. Transcribed from originals in possession of Mrs. R. L. Hoxie, Washington, D. C. (Transcription in Forest Service files.)
- (8/) "A Few Observations Concerning Past and Present Conditions of Salina Creek Watershed and Valley Range" by C. A. Mattsson, December 27, 1951. (Unpublished document, Forest Service files.)
- (9/) "Central Route to the Pacific" by Gwinn Harris Heap. Edited by LeRoy R. Hafen and Ann W. Hafen, Brigham Young University. The Arthur Clark Co., Glendale, California, 1957.
- (10/) "The Personal Narrative of Carl A. Mattsson," March 26, 1940. Fishlake National Forest files. (Unpublished)
- (11/) "The Sanpete Mountain Before and After the Manti Forest, Ephraim A. Madsen's Range Experiences Near 50 Years." River Basin Field Party Files. (Unpublished)
- (12/) Comments by Lauritz Nielson on changes and some of their causes in Ephraim Canyon April 14, 1952. (Unpublished document, River Basin files.)

- (13/) "A Study of Flood Conditions in Ephraim, Manti and Six Mile Canyon, Manti National Forest," by Robert V. R. Reynolds, Forest Examiner, September 1910 (Manti-LaSal National Forest files, unpublished).
- (14/) Statements of E. W. Crane, local historian as found in "The North Star." Vol. 3 No. 4 found in Salina Library and quoted from Fish-Lake N. F. files.
- (15/) Letters found in the Dixie National Forest files.

CHRONOLOGY OF SEVIER RIVER, BASIN FLOODS

The reader using the flood chronology will find that it is organized in two ways: The chronology lists each flood occurrence within the basin as it occurs in time; second, communities nearest to, or affected by floods, are indexed alphabetically and referenced to the chronology by page number.

For each flood, the chronology contains the following information when it is available: Date of flood occurrence, nearest community, stream or drainage, peak flow, and other descriptive notes.

Numbers in parenthesis used in the chronology refer to the sources of flood data listed, page 123. For an individual flood, more than one source of data may have been utilized; peak flow may have been obtained from one source and the notes on the flood from another.

This record of floods is not complete, but it is felt to be the most comprehensive compilation of past floods written to date. A complete flood record cannot be written because many floods were never documented and have passed from memory. Much of the information was obtained from existing tabulations of floods. The two publications, "Utilization of Surface Water Resources of Sevier Lake Basin, Utah" Geological Survey Water Supply Paper 920, and "Cloudburst Floods in Utah, 1850-1938" Geological Survey Water Supply Paper 994 were of great help. Not only was the information from these publications used directly, but they were a valuable aid in locating other sources where more detailed information could be found.

Floods were especially well documented in some localities, but not in others. Some of the probable reasons for this are:

1. Not all communities had a newspaper. Those that did differed in their attitude toward floods. Many editors and publishers probably did not feel that floods were very newsworthy unless they were large and dramatic, or a life was lost.
2. Floods from canyons issuing onto uncultivated rangelands were largely ignored. People did not recognize upstream damages from floods such as erosion and loss of fish habitat. The records of floods, therefore, seem closely related to how settled an area was, and whether or not improvements were destroyed and not to their actual frequency of occurrence.
3. Weather patterns and watershed conditions vary and there may be an actual difference in the number and severity of floods by locality.

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Ivie Creek

102

1961 August 23

Willow Creek

106

SEVIER, Sevier County

1889 June 6

Sevier River

40

1896 August 27

Clear Creek

49

1896 August 28

49

1899 July 14

52

1912 May 30

Clear Creek

63

1913 May 27

Clear Creek

64

1914 May 24

Clear Creek

65

1921 August 29

Clear Creek

70

1923

Clear Creek

71

1925 July 20

Clear Creek

72

1925 July 24

Clear Creek

72

1935 June 10

Clear Creek

81

1936 June 10

Clear Creek

82

1937 May 19

Clear Creek

84

1938 May 27

Clear Creek

85

1938 July

Clear Creek

85

1940 April 24

Clear Creek

86

1941 August 7

Clear Creek

87

1942 May 27

Clear Creek

87

1943 August 10

Clear Creek

89

1944 May 10

Clear Creek

90

1945 May 4

Clear Creek

90

1945 August 2

Clear Creek

91

1946 July 24

Clear Creek

91

1946 August 2

Clear Creek

93

1946 August 15

Clear Creek

93

1947 May 12

Clear Creek

94

1948 April 18

Clear Creek

94

1952 May 5

Clear Creek

95

1953 July 15

Clear Creek

96

1954 May 22

Clear Creek

97

1955 August 6-7

98

1955 August 17

Clear Creek

98

1957 June 5

Clear Creek

100

1958 May 24

Clear Creek

101

1961 May 20

Clear Creek

103

1961 August 23

Clear Creek

106

1962 February 9

Clear Creek

108

1963 August 2

Clear Creek

109

SIGURD, Sevier County

1896 July 14-17

Cedar Ridge Canyon

47

1925 July 21

Cedar Ridge Canyon

72

Sevier River

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CHRONOLOGY

(8/)

1852 August 1

Manti

Manti Creek

- - -

Manti, August 4, 1852

"Editor News:

Since Friday last the weather has been remarkably cool in comparison to what it was previous to that time in our peaceful city.

On Friday last, the 30 ult., there fell a very heavy rain in this quarter of San Pete Valley; on Sunday the 1st inst., we had the hardest rain that I ever saw; in 10 minutes our lots, streets, cellars and every place the water could penetrate was flooded, our large ditches made to irrigate the fields, could not contain a (unreadable word) of the water but it ran promiscuously throughout the streets from 4 to 10 inches deep, washing wood piles, hayracks, etc., before it. The rain lasted part of an hour then ceased but doing but little damage, but solving many days work in the way of irrigating.

Since Sunday the weather has been such as to hasten vegetation unto its final destiny. We have been abundantly blessed with rain this season; there is occasionally a new house springing into existence, our fields promise abundant harvest, our harvest has commenced and the brethern are all on the move, it is haying time in our valley and everything calls for action."

I am yours,

/s/ ANDREW L. SILER

1857 September 10

Manti

Manti Creek

- - -

(7/)

A cloudburst produced a medium flood.

1857 September 17

Manti

Manti Creek

- - -

(7/)

A cloudburst produced a medium flood.

1861 June

Deseret Sevier River - - -

"At Deseret a spring freshet washed away the dam. The men and boys toiled unitedly, and finally another dam was built in time to save the crops." (13/)

1862 June

Deseret Sevier River - - -

The dam built the prior year was again washed out due to floods. (13/)

1863 May

Deseret Sevier River - - -

In October of 1862, work commenced on a new structure but in May it was washed out by a spring flood. (13/)

1867 June 19

Levan Chicken Creek - - -
(4/)

The flood caused a great deal of damage to canals.

1868 May 6

Levan Chicken Creek - - -

Damages on the most part were small, very little information is available. (4/)

1868 Summer

Deseret Sevier - - -

"A fifth dam was completed at Deseret at an approximate cost of \$10,000 in 1863 and 64. In the summer of 1868, high water, unusual for this time of year, washed the dam away. The settlers, through constant repair and construction of the Deseret Dam and continued crop failure, were reduced to abject poverty and misery. The future of Deseret seemed hopeless, and the people moved to Oak Creek and established the town of Oak City." (13/)

1870 August 18

Spring City Cedar Creek - - -

(7/)
A summer cloudburst produced a severe flood.

1871 July 22

Moroni Moroni Canyon - - -
(4/7/)
No details available.

1872 June 3

Manti Manti Creek - - -
(7/)
A cloudburst caused a medium-sized flood.

1878 August 8

Wales - - -

"Town enveloped by a cloud that was suddenly divided by a light. A terrific roar followed. The damage following the cloudburst was considerable to crops and fields." (5/)

1878 August 8

Fairview San Pitch River - - -

Damages on the most part were small, there is little information available. (4/)

1879 August 7

Leamington Sevier River - - -
(7/)

A summer cloudburst caused a medium flood.

1881 Summer

Deseret Sevier River - - -

In 1874 and 1875, another dam was built at Deseret (the sixth). In 1881, a flood washed away a portion of the dam, but it was quickly repaired. (13/)

1881 Winter

Deseret Sevier River - - -

This winter the dam was carried away by a flood accompanied by an immense quantity of floating ice. (13/)

1884 June 20

Deseret

Sevier River

- - -
(7/)

Spring rains caused a severe wet mantle flood.

In the fall of 1882, the seventh dam was built at Deseret. This dam lasted through but one irrigating season. In the spring of 1884, the Sevier River had risen so high that it formed a new channel leaving the dam high and dry. (13/)

1886 June 9

Deseret

Sevier River

- - -
(7/)

Spring rains caused a severe wet mantle flood.

1886 August 17

Millard County

Sevier River

- - -

"A flood washed out the track bed of the Utah Central Railroad in some places and covered it in others." (5/)

1889 (Prior to) August 14

Marysvale

Sevier River

- - -

(Sevier Canyon)

"A cloudburst washed away the railroad tracks and filled the cuts with debris." (8/)

1889 June 6

Junction, Sevier

Sevier River

- - -

Juab and Millard Counties

"This storm was so fierce that the Sevier River rose six feet in a very short time. Principal damage was to the Utah Central Railroad through Sevier Canyon. Much of the track was also flooded between the mouth of Chicken Creek and Leamington. One small bridge was washed away and another undermined. Rails were bent and the alignment distorted." (2/)

1889 August 16

Ephraim

Ephraim Creek

(1/)
1,330 c.f.s.

Manti

Manti Creek

- - -

Mayfield	Twelve Mile & Woods Canyon	- - -
----------	-------------------------------	-------

Sterling	Six Mile Creek	- - -
----------	----------------	-------

1889 marks the first year that floods were destructive enough to receive State-wide attention. Mr. Robert Reynolds made a study of flood conditions in Ephraim, Manti, and Six Mile Canyons. The study was made in 1910, and he makes the statement that the first flood from these canyons occurred in 1889. Prior floods were apparently small enough to have been ignored by the early residents of Sanpete Valley. In Mayfield a life was lost, and the people of Sanpete Valley realized that still another adversary had to be contended with in their long struggle to make a home in Utah.

"Wood Canyon near Mayfield is only about one and a half miles long. A stream poured forth 6 rods or more in width and fully 5 feet deep in the center. The main stream was directed against the Jorgensen home, within which were Mrs. Jorgensen and six children. Mr. Jorgensen arrived and left his buggy and team on dry ground behind the stable where the flow of the flood had been deflected by this structure. His oldest boy came out to help with the horses and he left them in his care. Mr. Jorgensen found the other five children in the house floating around on a lounge in 3 feet of water and his wife holding up a cupboard to steady herself and also prevent it from falling on the children. Mr. Jorgensen broke a window to make an exit for the water. He then saw the stable which was protecting the boy with the team swept away and the buggy and horses rolling over and over. The boy with the buggy was drowned and also cattle and horses. Fences were broken, stables and corrals wrecked, sheds undermined, cellars filled, and orchards buried in debris." (8/)

People in Manti observed a "terrific thunderstorm" which produced a heavy roaring in Manti Canyon. Soon a flow eight feet deep came down the creek carrying huge trees, logs, and brush which were scattered over streets of the town. Several farm animals drowned and there was much property damage. (2/) Damages in Manti were estimated at \$2,500. (8/)

In Ephraim the flood was similar to Manti with mud up to three feet deep deposited in the streets. Some houses were flooded. (2/)

At Sterling many crops were lost with some damage to other property. (2/)

1889 August 18

Fairview	San Pitch River	- - -
----------	-----------------	-------

Levan	Chicken Creek	- - -
-------	---------------	-------

Oasis	Sevier River	- - -
-------	--------------	-------

Damages on the most part were small but there is little information available. (4/)

A summer cloudburst produced a medium flood at Levan. (7/)

At Oasis a summer cloudburst produced a severe flood. (7/)

1890 May 30

Leamington	Sevier River	2,330 c.f.s. (6/)
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1890 July 13

Manti	Manti Creek	- - -
-------	-------------	-------

A cloudburst occurred three or four miles up the canyon. The road in the canyon was covered with rocks and mud. Bridges in Manti were washed away and the streets flooded. (2/)

"For the second time in the course of a year the residents of Manti are the sufferers by a flood. Three or four miles up Manti Canyon a cloudburst occurred and precipitated the large amount of moisture with which the cloud was laden on the hills. On account of the sheep and cattle having eaten off all of the vegetation on the hills near town, there is nothing to hold the water or in any way arrest its flow. The consequence is that a heavy rain instead of soaking into the ground, floods the country below."

"Some bridges washed out, on others the planks were removed to save the bridges. Irrigation ditches filled and diversion structures were lost. Damage from this last storm was estimated at about \$1,000." (8/)

1890 July 16

Manti	Manti Creek	- - -
Ephraim	Ephraim Creek	- - -
Spring City		- - -

"On July 16, exactly eleven months after the disastrous flood of last year Manti was again visited by that terrible element of destruction a mad rush of water. Before anybody had time to think of fleeing to a place of safety the first of the flood, bearing upon its angry front the spoils of the mills in the canyon and the bridges above came tearing down through the center of town."

"The first obstruction met was at Christofferson's mill ditch. The dam is thrown across the creek at this place in order to raise the water sufficiently to fill the ditch which turns Christofferson's grist mill."

This dam blocked the flow of water and it rose back of the obstruction of the dam and the flood debris which had lodged there until the house of Mr. L. L. Dalton was completely surrounded by water and flooded."

The newspaper article describes the plight of many residences which were filled with mud and debris. Some examples are:

"It entered the basement story used by the family as kitchen, dining room and storehouse and literally buried in one muddy grave the furniture, provisions, and a great quantity of clothing belonging to this esteemable family. The cook stove was carried 12 to 14 feet from where it stood and was severely smashed."

"The Anna Christofferson home is situated ten feet or more above the bed of the creek and yet the water was waist deep within this home." (8/)

At Ephraim, floods from this same storm inundated several residences, swept away fences and covered many acres of crops. Damage here was estimated at \$2,000. The spirit of the people at this time is shown from this quote. "The flood at Ephraim is greatly to be deplored and many places have been damaged, and many persons are out of pocket that would be but vain repetition to name; but the people of Utah are proverbial for finding something to be thankful for; so they are thankful that it is no worse; that it did not come in the night, that no lives were lost and that the loss estimated at \$2,000 although very great, is mostly represented in labor and can be replaced with little cash outlay." (8/)

Floods also occurred at Spring City. Crops were covered and damages in the town were estimated from \$1,000 - \$1,500. (8/)

1890 August 31

Glenwood

Mill Canyon

- - -

"Sunday August 31 Glenwood was the scene of a flood. About one o'clock it began raining and soon was pouring in a blinding sheet, causing water to flow in the streets. Not long afterward, we heard a terrible rumbling sound and the people knew what it meant. Lots were nicely watered and in some instances a rich layer of alluvial soil was placed over them. Glenwood is occasionally the scene of small floods, but rarely does one such as this pay us a visit." (8/)

1891 May 9

Leamington

Sevier River

1,390 c.f.s.

(6/)

Note: These floods on the Sevier River occurred prior to the construction of reservoirs. The river was unregulated at this time.

1891 July 29

Fairview

Oak Creek

- - -

"The greatest flood that has ever been witnessed in the northern part of Sanpete County was witnessed in Oak Creek Canyon three miles north of Fairview last Wednesday. In the canyon three sawmills were swept away." Surrounding these mills were several homes housing families of the workers. Men working at the sawmills barely had time to remove the women and children from these houses before they were swept away. Trees and boulders weighing several tons were swept to the valley. "It did but little damage in the valley." (8/)

1891 August 8

Moroni

Moroni Canyon

- - -

(4/)

No details.

1891 August 13

Manti

Manti Creek

- - -

Sterling

Six Mile Creek

- - -

Fairview

Cottonwood

- - -

"At Sterling much debris was carried onto the farms at the mouth of the canyon within reach of the flood." At Manti, trees, mud, and other debris were carried into town causing considerable property damage. "Thorofares in the vicinity of the flood were a sight long to be remembered." (2/)



1891 August 13 flood at Manti. Looking south down Main Street from corner where present City Hall is located. (Forest Service photo).



1891 August 13 flood at Manti. Stores across street are located at the corner where Simmons Hardware now is. (Forest Service photo).

1891 August 16

Manti

Manti Creek

- - -

"Mud and water poured out of the canyon and into the streets covering yards and gardens. The sky was clear over the valley with no rain but there was a cloudburst on the upper watersheds of the creek. Logs, brush, and boulders were strewn over the flood area. Some houses were flooded with considerable property damage."^(2/)

1892 June 2-6

Leamington

Sevier River

1,220 c.f.s.^(6/)

1893 January 31

Leamington

Sevier River

1,300 c.f.s.^(6/)

1893 July 27

Leamington

Sevier River

1,300 c.f.s.^(6/)

Note: These floods on the Sevier River occurred prior to the construction of reservoirs. The river was unregulated at this time.

1894 March 22

Richfield

Sevier River

- - -

Spring rains caused a wet mantle flood of medium size.^(7/)

1896 June 1

Moroni^(4/)

Moroni Canyon

- - -

Ephraim^(7/)

Ephraim Creek

- - -

There is no data available on Moroni. At Ephraim a severe flood was caused by a summer cloudburst.

1896 July 5

Mt. Pleasant^(8/)

- - -

Fairview^(8/)

- - -

"A cloudburst above Mt. Pleasant on the 5th caused considerable damage to the town and fields adjacent. That burg seems to be unfortunate being in the path of disastrous floods of late."^(8/)

"At Fairview the track of the D&RGW was so heavily covered with debris that trains had to stop running until it could be cleared away."

"Standing crops were beaten down, barns, etc., were swept away, streets were submerged and much damage was done."(8/)

1896 July 12

Koosharem	Otter Creek	- - -
-----------	-------------	-------

A summer cloudburst caused a severe flood.(8/)

1896 July 13

Fairview (4/)

Fayette <u>(2/)</u> <u>(8/)</u>	Local Hills
---------------------------------	-------------

Ephraim <u>(2/)</u>	Ephraim Creek
---------------------	---------------

At Fayette: "About 4:30 o'clock p.m. on the 13th a black cloud could be seen in the south and it did not take many minutes until it had reached here, and had developed into a most terrific hailstorm and came down with such force breaking windows and lights, tearing shingles from the roofs and destroying all the garden truck and field crops of the place leaving none for seed."

"The hailstorm lasted about 20 minutes and was soon followed by an awful flood that came down from the hills, flooding almost the entire settlement, washing out bridges, tearing down fences, running into houses, filling up cellars, etc." (Crops escaping destruction from the hailstorm were wiped out by the flood.)

"The canal that we have built some 17 miles in length and which cost us thousands of dollars was washed out in many places and badly damaged."(8/)

1896 July 14-17

Holden <u>(7/)</u>		- - -
--------------------	--	-------

Koosharem	Otter Creek	- - -
-----------	-------------	-------

Sigurd <u>(7/)</u>	Cedar Ridge Canyon	- - -
--------------------	--------------------	-------

Richfield <u>(1/)</u> <u>(2/)</u> <u>(8/)</u>	Cottonwood	- - -
---	------------	-------

Ephraim <u>(8/)</u>	Ephraim Creek	- - -
---------------------	---------------	-------

Scipio (8/)	Ivie Creek	- - -
Monroe (8/)	Monroe Creek	- - -
Joseph (8/)		- - -
Gunnison (8/)		- - -
Annabella (8/)		

"Sevier County continues to suffer from sudden and violent downfalls of rain. Friday a small village a short distance south of Monroe was flooded and great damage done to farms, orchards, roads, and bridges. The roads were badly washed out between Elsinore and Richfield. Annabella also suffered another severe storm visitation. The loss to Sevier County, it is expected, will aggregate \$30,000." (8/)

Richfield - "It will be remembered that (last) Monday Richfield, Sevier County, was heavily damaged by a flood. Yesterday only 24 hours later after this first visitation there came another one worse than the first. Cottonwood Canyon is about two miles northwest of the town, which lies in line with it. A number of years ago a ditch was dug in such a manner as to carry away from town an excess of water coming down the canyon. But this time the flood was so great that it swept over and practically obliterated this ditch.

"The waters rushed on into town, submerging the streets, filling cellars, covering fields and gardens with mud and debris, destroying standing crops and great quantities of hay that had been recently cut.

"The damage Richfield has suffered from these two visitations has not been stated but it will amount to many thousands of dollars." (8/)

Sigurd - "Heavy floods came out of Cedar Ridge Canyon, bringing out hundreds of loads of wood, filling up canals with debris and covering fields." (8/)

Scipio - "On the 14th the heaviest storm in years produced a heavy flood; floods again on the 16th; four separate floods in two days." (8/)

Monroe - "Wednesday - Thunder, lightning, and damaging floods." (8/)

Joseph - "A week of rain, thunder, lightning, and cloudbursts, flooding the whole precinct; streams brought hundreds of cords of wood from the mountains, filling irrigation ditches full of debris." (8/)

Holden - "A cloudburst swept logs, boulders and mud into town. Barns, corrals, and outbuildings were carried away. Some homes were entered by water and debris." (8/)

"In Sanpete County destructive floods and storms of rain and hail also occurred. From many towns came accounts of damage done to crops etc., which in the aggregate must be heavy. In some cases the hailstones were as large as hazel nuts and killed poultry.

In Sanpete and Sevier Counties numerous washouts of railroad grades have occurred causing an interruption in the running of trains."(8/)

Ephraim - "We had the heaviest rains that have been known for years Plowed land being washed so that only the boulders are left."(8/)

Author's Note: There were so many, frequent floods that occurred in July within the basin that news articles indicate that they were not considered as individual incidents. Many small towns also probably experienced floods that went unrecorded because of the number of floods at this time.

Estimated damage from cloudburst storms in the week beginning July 13, 1896: Millard County \$100,000 and Sevier County \$30,000.(2/)

1896 August 27

Sevier	Clear Creek	2,000 c.f.s.(1/)
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Debris content estimated at 4.5 percent.(1/)

Neils Poulson was killed while attempting to ford Clear Creek in a large wagon containing seventeen men and boys. The current overcame the horses and the wagon started downstream. The current broke up the wagon. All were saved with some injuries but Mr. Poulson, who was drowned.(8/)

Estimated damage was \$1,490.(1/)

1896 August 28

Sevier Valley	- - -
---------------	-------

"A heavy shower caused floods which washed out headgates and diversion dams."(8/)

1897 (Exact Date Unknown)

Holden	Wild Goose Creek	- - -
--------	------------------	-------

Water system filled with mud and filth causing an epidemic of typhoid fever.(4/)

1897 August 7

Leamington Sevier River - - -

A medium flood. (4/) (no other data available).

1898 (Exact Date Unknown)

Mt. Pleasant Pleasant Creek 1,500 c.f.s. (1/)

1899 March 20

Panguitch - - -

Spring rains caused a rapid snowmelt producing a medium-sized flood. (7/)

1899 June 12

Spring City Cedar Creek - - -

A summer cloudburst caused a light flood. (7/)

1899 July 11

Manti Manti Creek - - -

An article in the July 12, 1899, issue of the Deseret Evening News graphically describes this flood.

"A disastrous flood, one of the greatest ever known here, visited Manti last night. The two city creeks overflowed their boarded channels and poured a muddy deluge filled with floating driftwood, debris, haystacks and bridges, through the streets in all the lower part of the city. When people heard the roar, they rushed from their houses to the creek. Other men mounted horses and rode rapidly in every direction to give warning of the flood. The ditch was nearly full and was roaring tremendously and filled with black mud and in places was white with foam. Then came the crowning catastrophe up the stream was seen a perfect wall of water several feet above the main current, and pushing in its front a large number of logs and planks. Each bridge was carried away as the flood reached it. Haystacks, hen coops, and stables were swept away and carried along the stream. Sick people had to be rushed from their homes as the flood approached.

"Damage to private property estimated at many thousands of dollars.

"The general opinion is that the flood was caused by a cloudburst and was possible only because of the barren nature of Manti Canyon.

It is thought that the only remedy will be to plant trees on the banks of every tributary of the main stream to catch the brush, logs, and debris that now rush unimpeded into the canyon stream. Then it is thought that the canyon must be absolutely reserved from cattle and sheep herds and systematic forestry carried on in it, with the aid, if possible, of the State or National Government. The canyon is now bare and barren and must be brought back to its former state of forests, shrubbery and verdure if floods are to be evaded."(8/)

In a later article published in the July 15, 1899, issue of the Deseret Evening News an astute reporter tells of the aftermath of the flood and of the watershed conditions in Manti Canyon.

"The effect of the flood at Manti continue to be apparent at every hand. Much of the drift wood and rubbish has been cleared from the streets but the layer of mud has not yet dried and bridges have not yet been replaced.

". . . the soil and mud delivered with the flood seems to be high in fertility and should prove productive on the gardens and fields covered. Also the flood gave the trees and orchards of the city a much needed watering. . . . The most valuable result of the flood will be, however, the turning of public attention to the absolute necessity of reserving the canyons that directly overhang the towns and cities of the west and of making forest reserves of them. This flood comparatively harmless as it is, will serve as a warning to the people of the west generally, and may lead to an appreciation of the benefits of systematic forestry culture and of reserving certain canyons and headwaters from being used as cattle and sheep ranges by the stockmen.

"The writer has just paid a visit to the mouth of the canyon. The hills are entirely bare of grass and of undergrowth and present a wretched and desert-like appearance. The only vegetation remaining on them consists of the cedars, the oak-brush, and the sagebrush; and these shrubs are not close enough together to delay the water in its rush to the main channel after every rain storm. Moreover, many of the hillsides are so cut up by the hoofs of the passing herds that the soil lies loose and ready to wash at once into the stream.

"The destruction of the grass and vegetation at the headwaters of all the streams of the Rocky Mountain Plateau will be followed as soon as it is thoroughly accomplished, by a relapse of the towns and cities and farming areas that depend upon irrigation into their primitive desert conditions."(8/)

Flood damages are now estimated at \$35,000.(8/)

1899 July 14

Sevier County	Sevier River	- - -
---------------	--------------	-------

Heavy showers washed out several hundred feet of railroad track. (6/)

1899 August 6

Fairview	Cottonwood Creek	- - -
----------	------------------	-------

Field flooded in lower part of town. (4/)

1899 August 7

Ephraim	Ephraim Creek	1,100 c.f.s. (1/)
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1900 May 26

Manti	Manti Creek	- - -
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Spring rains caused a rapid snowmelt resulting in a medium-sized wet mantle flood. (7/)

1901 May 20, 28, 29

Gunnison	San Pitch River	125 c.f.s. (6/)
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1901 July 9

Mt. Pleasant	Cedar Creek	- - -
--------------	-------------	-------

	Pleasant Creek	1,250 c.f.s. (1/)
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1901 August 1

Manti

Manti Creek

- - -

A cloudburst in the canyon flooded the principal part of the city. Hundreds of cords of logs and masses of debris of all kinds were deposited in the streets. Fences were swept away, gardens and lawns flooded, cellars filled, and houses flooded. (2/)



Manti City August 1, 1901. Mud and debris deposited in the streets as a result of floods. (Photo courtesy Lloyd Tuttle, Manti, Utah.)



Manti City August 1, 1901. The force of the flood water caused the bridge under Main Street to raise. Large store on right is where Jensen's and Carpenter's store is located. (Photo courtesy Lloyd Tuttle, Manti, Utah.)



Manti City August 1, 1901. Looking southeast up the creek from where Manti Garage is now located. (Photo courtesy Lloyd Tuttle, Manti, Utah.)



Manti City August 1, 1901. Debris piled around building now housing the Manti grocery. (Photo courtesy Lloyd Tuttle, Manti, Utah.)



Manti City August 1, 1901. Note the wooden plank used to line the creek in an attempt to keep the creek from eroding in the channel. James Tooth place. Rock building is just east of Manti Grocery. (Photo courtesy Lloyd Tuttle, Manti, Utah.)



Manti City August 1, 1901. Clearing debris following the flood. Flag is on old Madsen Hotel. This building also housed Post Office. Now Manti Garage occupies this site. (Photo courtesy Lloyd Tuttle, Manti Utah.)

1901 August 3

Richfield

Cottonwood Creek

- - -

A cloudburst in the canyon caused a mud and debris-laden stream to pour forth. Part of the flow was diverted from the town by a large canal and a couple of deep hollows north of town. The canal was filled and much damage resulted to flooded fields. ^(2/)

1901 August 4

Antimony

700 c.f.s. ^(1/)

(Called at this time Coyote.)

A cloudburst occurred in the hills west of the valley. Hunter farm badly damaged. Buildings and corrals were washed away. One family was caught in the flood and a child drowned. Farms were covered with mud about 3 feet deep. ^(5/)

1901 August 6

Fairview	Cottonwood Creek	- - -
	Oak Creek	- - -
Milburn	San Pitch River	- - -
Ephraim	Ephraim Creek	600 c.f.s. (1/)

Milburn - "A flood descended into the village of Milburn and did considerable damage." An avalanche of water freighted with trees and boulders hurled itself down the mountain. The people of Milburn were caught up in a contagion of fright and a panic followed. Water was about 3 feet deep in portions of the town." (8/)

Fairview - "About one o'clock a dull rumbling noise was heard which continued for one hour resembling distant thunder. Later on it was ascertained that two floods had occurred north of town, one at Oak Creek and the other at Milburn.

"At about 10 o'clock p.m. a flood was heard coming down Cottonwood Canyon and before many minutes a tremendous body of water was at the edge of town carrying everything before it, and at that time it was dark as pitch. Bridges and culverts were torn up and their places taken with large roots and rubbish, fences, lumber, wagons, harrows, hay rakes and other farming implements were carried away or buried in the mud; haystacks, pigs and chickens were carried away and many cellars filled with water creating great losses to the owners. The road in the canyon was destroyed." (8/)

Ephraim - "The precipitation was very light in the valley, but heavy enough in the mountains to cause floods of considerable extent." (8/)

1901 August 30

Spring City	Cedar Creek	- - -
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A summer cloudburst caused a light flood. (7/)

1901 October 31

Milburn	Dry Creek	- - -
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A summer cloudburst caused a medium flood. (7/)

1902 May 14

Gunnison	San Pitch River	155 c.f.s. (6/)
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1903 March 19

Hatch	Sevier River	- - -
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Panguitch	Sevier River	- - -
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Spring rains caused a severe wet mantle flood. (7/)

1903 May 31

Gunnison	San Pitch River	158 c.f.s. (6/)
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1903 October

Salina	Salina Creek	1,000 c.f.s. (1/)
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Niotche	- - -
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Railroad damaged by a small flood. (4/)

1903 (Exact Date Unknown)

Antimony (4/)

(No details)

1904 January 28, February 5

Gunnison	Sevier River	372 c.f.s. (6/)
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1904 May 18, 24

Gunnison	San Pitch River	264 c.f.s. (6/)
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1905 April 19

Deseret (Millard County)	Sevier River	- - -
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Spring rains caused a severe flood. (7/)

1905 May 28

Gunnison	Sevier River	640 c.f.s. (6/)
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1905 August 25

Richfield	Cottonwood	1,500 c.f.s. (1/)
	Willow Creek	- - -

"One of the most destructive floods known in years. A huge body of water emerged from canyons and spread over the valley. The Sevier Valley Canal filled with mud and rocks. Fields were covered, shocks of grain were submerged in water or mud and many were carried away. Main street was flooded and nine head of cattle were washed away and drowned." (2/)

1905

Axtell	Willow Creek	1,200 c.f.s. (1/)
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1905 August 29

Gunnison	San Pitch River	720 c.f.s. (6/)
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1906 May 24

Joseph	- - -
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Elsinore	- - -
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Severe wet mantle floods. (7/)

1906 May 28

Gunnison	Sevier River	2,240 c.f.s. (6/)
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1906 June 7

Richfield	- - -
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Severe wet mantle flood. (7/)

1906 June 27

Deseret	Sevier River	- - -
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Oasis	Sevier River	- - -
Abraham	Sevier River	- - -
Hinkley	Sevier River	- - -

Severe wet mantle floods due to spring rains and rapid snowmelt. (7/)

1906 August 2

Panguitch	Pangitch Creek (4/)	- - -
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(No other information available)

1907 June 6

Ephraim	Ephraim Creek	- - -
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Spring rains caused a light wet mantle flood. (1/)

1907 June 9

Moroni	Moroni Canyon	- - -
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Spring rains caused a light flood. (7/)

1907 June 13

Gunnison	Sevier River	2,080 c.f.s. (6/)
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1907 August 21

Moroni	Local Canyons	- - -
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Fountain Green	Local Canyons	- - -
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A summer cloudburst produced a light flood. (7/)

1908 August 2

Panguitch	Red Canyon	- - -
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A cloudburst at the top of Red Canyon destroyed the canyon road and carried away the bridge. Syrett home and barn were flooded. Hay was destroyed and poultry carried away. (2/)

1908 August 8

Gunnison	Sevier River	701 c.f.s. (6/)
Elsinore	Mortenson Creek	- - -

A cloudburst on the foothills between Joseph and Elsinore produced a flood which filled the Sevier Valley canal with mud and gravel and cut a gully about 35 feet deep, about 25 feet wide, and 500-600 feet long. Mud and debris was piled about 10 feet deep over the county road and some farmlands were covered. (2/)

1908 August 10

Circleville	Pine Creek	- - -
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A flood five feet deep swept down Pine Creek carrying timber and boulders. It carried away a wagon and three horses and buried them under mud and gravel. A great deal of damage resulted to roads in the vicinity. (2/)

1908 (Exact Date Unknown)

Ephraim	Ephraim Creek	- - -
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In the book "Ephraim - First 100 Years" (Centennial Book Committee, Ephraim, Utah) is found the following:

"Mr. Jensen (J. H. Jensen) remembers one of what he thinks was the biggest flood in 1908. He was sitting at the intake of the electric light ditch and water came off and went across the ditch carrying rocks as large as seventy-five to one hundred tons."

1909 June 16

Deseret and vicinity	- - -
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A spring rain caused a severe flood. (7/)

1909 August 10

Circleville Sevier River - - -

Richfield Sevier River - - -

At Circleville and Richfield a summer cloudburst produced a severe flood. (7/)

1909 August 11

Fountain Green San Pitch River - - -

A summer cloudburst produced a medium flood. (7/)

1909 August

Salina Salina Creek 2,200 (1/)

Railroad damage and agriculture damage estimated at \$4,170. (1/)

1909 August 21

Mt. Pleasant - - -

Fairview Cottonwood Creek - - -

Fountain Green - - -

Wales - - -

Ephraim Ephraim Creek 2,200 c.f.s. (1/)

Ephraim - Torrents washed down the hillsides and into town carrying everything before them. Huge boulders and logs were carried down. The flood damaged reservoirs, irrigation ditches, and highways. Streets were flooded, cellars filled, and gardens and orchards were washed out. (2/)
Damage at Ephraim was estimated at \$25,060. (1/)

Wales - Four more floods occurred, the last one on August 21st. (7/)

1909 September 9

Gunnison Sevier River 2,000 c.f.s. (6/)

1910 January 31

Panguitch	Panguitch Creek	- - -
	Sevier River	- - -

A warm rain caused a large wet mantle flood. (7/)

1910 (Exact date unknown)

Mt. Pleasant	Pleasant Creek	700 c.f.s. (1/)
	Twin Creeks	440 c.f.s. (1/)

Damages estimated at \$3,290. (1/)

1912 May 30

Sevier	Clear Creek	226 c.f.s. (6/)
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1912 June 5

Hatch	Sevier River	1,210 c.f.s. (6/)
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1912 July 28

Ephraim	Ephraim Canyon	- - -
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A rainstorm occurred at the head of Ephraim Canyon within a belt of two miles and between elevations of 9,000 and 10,000 feet. The total storm amounted to 0.41 inches which fell over a period of two hours. A flood of sufficient force developed to reach the town of Ephraim, 10 miles below, covering the streets and some farm land, and filling the basements of buildings with mud and debris. The flow was laden with silt, logs, vegetable matter, and during the most violent period, with rocks containing as much as 30 cubic feet of material. The flood destroyed wagon roads, trails, and irrigation ditches. (12/)

1912 July 30

Ephraim	Ephraim Creek	- - -
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"A flow of torrential violence originated at the head of Becks Canyon. A rain amounting to 0.55 of an inch, the greater part of which fell within an hour, started at 11:00 a.m. and at 11:45 a.m. a flood was pouring out of a small side canyon which drains into Becks Canyon from an area of less than 1,500 acres, at an elevation of about 10,000 feet.

An examination after the flood showed that the soil had been very densely packed by grazing previous to the storm. The water was so infiltrated with sediment it did not run but rolled over and over, picking up small rocks and gravel. The flow increased to a front of from 10 to 25 feet wide and from 6 to 8 feet deep. The main flow lasted approximately one hour, varying in volume as had the rain 30 minutes previous. Owing to the enormous deposits of debris, the course at the mouth of the channel changed three times. As the stream changed its course from one side to another, enormous quantities of material were deposited only to be carried away later. At one time approximately 5,000 cubic feet of the bank was torn out in a few minutes as the old bed filled up with material from above. All these tons of soil, vegetable matter, and other material were carried down by the rushing water in less than two hours after the rain first began to fall."^(12/)

1913 April 1

Kingston

East Fork, Sevier
River

518 c.f.s.^(6/)

1913 May 27

Sevier

Clear Creek

158 c.f.s.^(6/)

1913 August 4

Moroni

One of the worst storms ever known caused local flooding over an area $1\frac{1}{2}$ miles wide and 3-5 miles long.^(2/)

1913 August 9

Richfield

West Canyons

- - -

Every canyon west of Richfield had its flood.

Both north and south of Richfield considerable damage was done to crops.^(3/)

1913 August 19

Mayfield

Local Foothills

- - -

A flood came down from the foothills and swept the north side of town.^(3/)

1913 (Exact date unknown)

Milburn Birch Creek - - -

A cloudburst caused a severe flood. (7/)

1913 August 24

Ephraim Ephraim Creek 1,000 c.f.s. (1/)

Sunday evening August 24, the annual August flood visited Ephraim and broke all previous records in property damage. Mud, gravel, boulders, and debris covered much of the town. Many cellars were filled with mud and lawns were covered so deep as to destroy them. One boulder contained 15 cubic feet. (3/) Damages for this flood were estimated at \$4,240. (1/)

1913 August 26

Mayfield Local Canyons - - -

Another flood of greater severity than August 19 swept the south side of town. Sand, gravel, and boulders in large quantities covered the land, in some places so completely as to render it worthless. (3/)

1913 August 29

Levan Wide Canyon - - -

One of the heaviest rains in years. On the west side of the valley large streams of water swept down every canyon, doing considerable damage to farmlands. (3/)

1914 May 9

Kingston East Fork, Sevier 570 c.f.s. (6/)
River

1914 May 24

Sevier Clear Creek 226 c.f.s. (6/)

1914 May 26

Hatch Sevier River - - -

Panguitch Panguitch Creek - - -

Heavy spring rains caused wet mantle floods. (7/)

1914 June 1

Hatch	Mammoth Creek	535 c.f.s. (<u>6/</u>)
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1914 July

Manti	Manti Creek	- - -
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Record breaking rains causing floods. (3/)

1914 (Exact date unknown)

Marysvale	West Canyons	- - -
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Floods resulted from a severe summer cloudburst. (4/)

1915 March 25

Angle	Otter Creek (above reservoir)	78 c.f.s. (<u>6/</u>)
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1916 May 10

Hatch	Sevier River	1,040 c.f.s. (<u>6/</u>)
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1916 May 12

Hatch	Mammoth Creek	511 c.f.s. (<u>6/</u>)
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1916 July 1

Glenwood	Water Canyon	- - -
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"For two days the citizens of Glenwood were wearing their high water pants." (1/)

1916 July 4

Richfield	Cottonwood	- - -
	Willow Creek	- - -

Richfield was converted into a cesspool for all the excess flood waters of Cottonwood and Willow Creek Canyons.

Quantities of dead wood rushed down Cottonwood Canyon. "Rattlesnakes, lizards, rabbits, and other small reptiles and animals were noticeable in the maelstrom. One large rattlesnake with a string of sleighbells and a pearl button was dispatched by visitors." ^(11/)

1916 August 1

Fairview Cottonwood Creek - - -

Street were flooded from a cloudburst in Blind Fork Canyon, which is about six miles up Cottonwood. Water in the town was from two to six feet deep. Sheds, buggies, and farm machinery were swept away. Gardens were destroyed, cellars and ground floors flooded. The electric power-plant was put out of commission. ^(2/)

1916 August 1-6

Kingston	Sevier River	900 c.f.s. ^(6/)
	East Fork, Sevier River	660 c.f.s. ^(6/)
Circleville	Sevier River	1,600 c.f.s. ^(6/)

Kingston reported that one-half of the Piute County hay crop was destroyed by rains. Sevier River is out of its channel. ^(5/)

1916 (Exact Date Unknown)

Mt. Pleasant	Twin Creeks	320 c.f.s. ^(1/)
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Damages were estimated at \$270. ^(1/)

1917 (Exact Date Unknown)

Monroe	Monroe Creek	- - -
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Road was destroyed. ^(4/)

1917 March 27

Angle	Otter Creek (Above reservoir)	84 c.f.s. ^(6/)
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1917 May 18

Circleville	Sevier River	1,020 c.f.s. (6/)
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1917 June 10

Hatch	Mammoth Creek	795 c.f.s. (6/)
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1917 June 17

Panguitch	Panguitch Creek	300 c.f.s. (6/)
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1918 March 13

Circleville	Sevier River	1,000 c.f.s. (6/)
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Kingston	Sevier River	1,000 c.f.s. (6/)
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1918 June 19

Mt. Pleasant	Pleasant Creek	5,000 c.f.s. (1/)
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"Death and devastation in wake of cloudburst at Mt. Pleasant.

"Luis Oldham Farmer, drowned and property loss estimated at \$100,000.

"Three streets running east and west and main street running north and south are covered with mud, boulders, and debris. At least one dwelling house was swept away and smaller buildings all over town are toppled about and destroyed. Fences are demolished, agricultural machinery, wagons, automobiles, and feed racks are topsy turvey and cellars and basements flooded.

"There was no warning. The crest of the flood swept through the streets and people barely had time to flee for their lives. When the flood had spent its force and the excitements had partially subsided word came that Mr. Oldham had lost his life in trying to rescue members of his family, from the raging torrent.

"Merchandise in store basements is under water and windows are broken everywhere. The Mt. Pleasant branch of Consolidated Wagon and Machinery Company suffered heavy loss. The yard was inundated and agricultural implements and machinery are under the debris. All along the line of Pleasant Creek, bridges are washed out, dams torn away and the stream today is running in new channels." (8/)

Damages were estimated at \$166,180. (1/)

1918 July 9

Mt. Pleasant	Pleasant Creek	1,900 c.f.s. (<u>1/</u>)
	Twin Creeks	760 c.f.s. (<u>1/</u>)

For the second time in three weeks, Mt. Pleasant had been swept by a flood. "The city had scarcely recovered from the first flood and the people are distressed today, many having suffered losses and privation both times." (8/)

The city had been without power since the previous flood because of damage to the powerplant. Damages were about the same and from the same causes as the previous flood.

Damages estimated at \$23,940. (1/)

1919 August 8

Kingston	East Fork, Sevier River	900 c.f.s. (<u>6/</u>)
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1920 May 23

Circleville	Sevier River	1,110 c.f.s. (<u>6/</u>)
Kingston	Sevier River	1,260 c.f.s. (<u>6/</u>)

1920 May 24

Hatch	Sevier River	1,130 c.f.s. (<u>6/</u>)
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1920 (Exact Date Unknown)

Ephraim	Axe Handle Creek	750 c.f.s. (<u>1/</u>)
	Ephraim Creek	800 c.f.s. (<u>1/</u>)

Damage was estimated at \$3,720 from the Axe Handle Flood and \$800 from the Ephraim Creek Flood. (1/)

1920

Milburn	Birch Creek	- - -
	North Creek	- - -

Fountain Green

Tids Canyon

620 c.f.s. (1/)

At Milburn, summer cloudbursts caused severe floods. (7/)

At Fountain Green the flood deposited large rocks and several feet of mud and debris over the area. One home was demolished and six or seven homes were severely damages. Two hundred acres were covered with rock and debris. (4/) Damages were estimated at \$9,110. (1/)

1921 July 10

Manti

Manti Creek

- - -

Record breaking rains caused floods. (4/)

1921 July 13

Hatch

Proctor Canyon

- - -

Heavy rains caused the worst flood known in Proctor Canyon.

Damage \$8,000 - \$12,000. Heavy rains occurred again on July 30. (3/)

1921 July 30

Panguitch (4/)

(No details)

- - -

1921 August 29

Sevier

Clear Creek

- - -

A summer cloudburst brought mud, rock and debris from Clear Creek to the Sevier River. The railroad paralleling Sevier River was damaged. (4/)

1922 May 8

Kingston

East Fork, Sevier
River

1,740 c.f.s. (6/)

1922 May 21

Circleville

Sevier River

1,960 c.f.s. (6/)

Kingston

Sevier River

1,460 c.f.s. (1/)

1922 May 26

Hatch	Sevier River	1,490 c.f.s. (<u>6/</u>)
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1922 June 30

Monroe	Monroe Creek	- - -
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A cloudburst in the hills east of Monroe Thursday at noon was the cause of considerable damage to gardens and crops in the town and outside of town were greatly threatened. Mud and debris were deposited from eight to ten inches deep. Monroe was without power or water for three days. (11/)

1922 (Exact Date Unknown)

Monroe	Manning Creek	- - -
	Bertlesen Wash	400 c.f.s. (<u>1/</u>)
	Sand Canyon	350 c.f.s. (<u>1/</u>)

Manning Creek - The flood caused a great deal of damage east of Sevier River. The dike at Bowery Lake Reservoir broke. Some mud and rock were deposited at the mouth of Manning Creek but about 80 percent of the flood reached cultivated lands. (4/)

Damages from Bertlesen Wash were estimated to be \$910. (1/)

1923 (Exact Date Unknown)

Sevier	Clear Creek	250 c.f.s. (<u>1/</u>)
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Damages estimated at \$410. (1/)

1923 (Exact Date Unknown)

Manti	Manti Creek	- - -
Sterling	Six Mile Creek	- - -
Mayfield	Twelve Mile Creek	- - -
Fairview	San Pitch River	- - -

Summer cloudbursts caused severe floods. (4/) (7/)

1924 August 14

Moroni	Moroni Canyon	- - -
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Fountain Green	Tids Canyon	- - -
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Moroni - Flood damaged highways and washed farmlands. (3/)

Fountain Green - As a result of the floods, the farms south of Fountain Green affected by Tids Canyon were abandoned; only remnants of several homes remain. (4/)

1925 July 14

Redmond	Sevier River	- - -
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A summer cloudburst produced a light flood causing some damage to the railroad. (7/)(4/)

1925 July 20

Sevier	Clear Creek	- - -
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A large flood came down the narrows in Clear Creek Canyon. The road was entirely washed away, and it will be impossible for travelers to go to Millard and Beaver Counties by way of the canyon. (11/)

1925 July 21

Sigurd	Cedar Ridge	1,000 c.f.s. (11/)
	Sevier River	- - -

A light flood damaged the railroad bridge at Sigurd. (5/)

1925 July 24

Sevier	Clear Creek	100 c.f.s. (1/)
Salina	Salina Creek	1,600 c.f.s. (1/)
Monroe	Monroe Creek	600 c.f.s. (1/)
Axtell	Willow Creek	270 c.f.s. (1/)
Marysvale		- - -

Damages were estimated at \$920 for Monroe, \$5,180 in Salina, and \$70 near Clear Creek. ^(1/) At Marysvale, a cloudburst flood damaged the railroad bridge. ^(5/)

1926

Mt. Pleasant	Pleasant Creek	700 c.f.s. ^(1/)
	Twin Creek	370 c.f.s. ^(1/)

Damages were estimated at \$770 from Pleasant Creek and \$370 from Twin Creek. ^(1/)

1926 May 23

Elsinore	Sevier River	- - -
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Spring rains caused some railroad damage. ^(7/)

1926 August 5

Marysvale	Sevier Canyon	- - -
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The state road through Sevier Canyon was badly damaged by a heavy rain, causing a flood. The road was closed to traffic for one week. ^(11/)

1927 August 11

Scipio	Round Valley Creek	- - -
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A severe cloudburst occurred in the mountains east of town. A flood covered most of the town and fields. Gardens and field crops were generally destroyed. Cellars flooded. ^(2/)

1927 September 19

Junction	City Creek	- - -
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Floods in the mountains damaged roads. ^(5/)

1928 August 21

Salina	Salina Creek	820 c.f.s. ^(1/)
Fairview	San Pitch River ^(4/)	- - -

Gunnison (5/)		- - -
Mt. Pleasant	North Creek (7/)	- - -
Manti	Manti Creek (7/)	- - -
Sterling	Six Mile Creek (7/)	- - -
Mayfield	Twelve Mile Creek (7/)	- - -

Damages at Salina were estimated to be \$2,730. (1/)

At Gunnison the flood was described: Thousands of dollars damage was caused by floods from the mountains. Business houses flooded; water was one foot deep in main street. (5/)

Floods at other localities were described as "severe." (7/)

1929 August 27

Richfield	Cottonwood	- - -
Aurora	Denmark Wash	2,000 c.f.s. (1/)
Axtell	Willow Creek	820 c.f.s. (1/)
Ephraim	Axe-Handle	1,800 c.f.s. (1/)

Richfield - A heavy rain and floods. Farmers below Flat Canyon lost heavily. (5/)

Aurora - Damages estimated at \$560.

Axtell - \$1,910, Axe Handle \$10,770. (1/)

1929

Fairview	San Pitch River (4/)	- - -
Sterling	Six Mile Creek (7/)	- - -
Manti	Manti Creek (7/)	- - -
Mayfield	Twelve Mile Creek (7/)	- - -

Fairview - A small flood damaged the railroad. (4/)

Other - Other floods are described as "severe."(7/)

1930 August 2-3

Salina	Salina Canyon	1,150 c.f.s. <u>(1/)</u>
Sigurd	Red Canyon	- - -
	Cedar Canyon	- - -
Aurora	Denmark Wash	3,000 c.f.s. <u>(1/)</u>
	Aurora Canyon	- - -
Glenwood	Water Canyon	- - -

A series of four cloudbursts occurred in the vicinity of Salina. A flood swept out of Salina Canyon and over part of the city. The following day floods came out of Denmark Wash, Aurora Canyon, Red Canyon and Cedar Canyon. Crops were destroyed. The State canal was cut out in six places. A landslide occurred about 17 miles up Salina Canyon, blocking the road.(5/) Damages from Denmark Wash were estimated at \$5,120.(1/)

At Salina, damages were estimated at \$15,000.(11/)

At Glenwood, cloudbursts resulted in a body of water ten feet deep emerging from the canyon south of town. Every street in town carried a portion of the stream, and all lots in the upper part of the town were badly flooded.(11/)

1930 August 4-10

Kingston	Sevier River	1,000 c.f.s. <u>(6/)</u>
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1930 August 13

Monroe	Bertlesen Wash	350 c.f.s. <u>(1/)</u>
	Sand Canyon	450 c.f.s. <u>(1/)</u>
Glenwood	Parcel Creek and Flood Hollow	1,500 c.f.s. <u>(1/)</u>
Richfield	Local Rains	- - -

1930 August 20

Salina	Salina Creek	900 c.f.s. (1/)
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A cloudburst in the canyon washed out the railroad track. Traffic was suspended for 22 days. Damage estimated at \$10,000. (5/)

1930 September 6

Richfield	West Canyons	- - -
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A serious electrical storm continued all night. Floods rushed out of canyons, washing out roads and bridges. (5/)

1931 July 30

Richfield-Elsinore	West Canyons	- - -
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A summer cloudburst produced floods from four side canyons. (7/)

1931 August 14

Glenwood		- - -
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Salina	Salina Canyon	750 c.f.s. (1/)
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Aurora	Denmark Wash	1,500 c.f.s. (1/)
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Sigurd	King Meadow Canyon	- - -
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Glenwood - Floods covered the highway between Glenwood and Richfield with water three to six feet deep. Grainfields are badly damaged. (5/)

Damages from the flow from Denmark Wash were estimated at \$2,200. (1/)

1931 (Exact Date Unknown)

Oak City	Oak Creek	600 c.f.s. (1/)
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Damages estimated at \$1,460. (1/)

1932 July 10

Junction	City Creek	- - -
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	Sevier River	- - -
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Antimony

- - -

At Junction rain and hail caused canals and irrigation ditches to overflow. Streets were filled with water. The worst flood known for some time occurred between Antimony and Escalante. (5/)

1932 July 17

Panguitch

Panguitch Creek (4/)

- - -

(no other data)

1932 August 17

Antimony

Wash-Kings Hollow

1,000 c.f.s. (1/)

Most severe flood in Antimony history. 350 tons of hay, 150 tons of alfalfa, 2,000 bushels of grain, and 2,000 rods of fence lost. Canals were filled with debris and sediment. Bridges washed out and East Fork of Sevier River filled with debris. (4/) Damages estimated at \$8,800. (1/)

1932 August 21

Panguitch

Panguitch Creek (4/)

- - -

Antimony

Pole Canyon

900 c.f.s. (1/)

Antimony Creek

- - -

Widsoe

Dry Wash

- - -

At Antimony, dry washes were filled with torrents carrying boulders, timbers, and mud, which was strewn over farms, gardens, and roads, covering a stretch of about 2½ miles. Hay was swept away and stacks left standing were badly damaged by water and mud. Some houses were partly inundated and furniture ruined. Cellars were filled with mud and water. Dry Wash bridge was swept away, the bridge over Antimony Creek was badly damaged.

1932 August 22

Kingston

East Fork, Sevier
River

5,858 c.f.s. (5/)

1932 (Exact Date Unknown)

Monroe

Sand Canyon

600 c.f.s. (1/)

Damages estimated at \$1,880. (1/)

1933 July 10

Ephraim	Ephraim Creek (5/)	500 c.f.s. (1/)
Manti	Manti Creek (7/)	- - -
Sterling	Six Mile Creek (7/)	- - -
Mayfield	Twelve Mile Creek (7/)	- - -

Ephraim - A thunderstorm of short duration, but of intense volume, caused a flood in Ephraim Canyon. (5/) Damage was estimated at \$3,540. (1/)

Other floods were described as "severe." (7/)

1933 July 30

Monroe	Monroe Creek	- - -
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A cloudburst in Monroe Canyon produced hundreds of tons of rock, trees, and water, which rushed through the canyon tearing out the road, the dam above the powerhouse, and the domestic water supply pipeline for the city. Damage to the powerhouse itself was estimated at \$1,000. (2/)

1933 August 11

Junction	Kingston Canyon	- - -
Aurora	Denmark Wash	1,850 c.f.s. (1/)
Salina	Salina Creek	800 c.f.s. (1/)

Junction - Heavy rains caused a flood down Kingston Canyon. The road washed out. Debris was spread over a quarter mile area. Damages near Aurora were estimated at \$1,850 and at Salina \$2,790. (1/)

1933 (Exact Date Unknown)

Fairview	San Pitch River (4/)	(No details)
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1934 July 20

Mt. Pleasant	Coal Fork Canyon	- - -
Manti	Manti Creek	- - -

A cloudburst caused a light flood. (7/)

Manti - Cloudbursts in the canyon sent three floods through town. Road washed out, powerplant canal damaged.

1934 July 21

Salina	Lost Creek	- - -
	Salina Creek	800 c.f.s. (1/)

"Morris Curtis a 16-year old son of Mrs. Gene Curtis of Salina was drowned when he was caught in a sudden flood which poured torrents down Lost Creek. He and his brother were herding goats when the flood came." (8/)

Damages estimated at Salina were \$2,700. (1/)

1934 July 23

Mt. Pleasant	Pleasant Creek	900 c.f.s. (1/)
	Twin Creeks	550 c.f.s. (1/)
Gunnison		- - -
Lyndyll (5/)		- - -
Holden (5/)	Wide Creek	- - -

Mt. Pleasant - "On the heels of two splendid rainstorms, which struck Mt. Pleasant and vicinity Friday and Saturday bringing the first reasonable fall of moisture in many months, a flood Saturday poured into town along both Pleasant and Twin Creek channels. Some streets and lots were flooded but no great damage done." (8/) \$3,090 damages from Pleasant Creek and \$9,660 estimated from Twin Creek. (1/)

Gunnison - Heavy showers of near cloudburst proportions swept the lower canyons to the east of town. Considerable damage resulted to dividers and headgates. (2/)

(No details available for other towns)

1934 July 24

Manti	Manti Creek	- - -
Spring City	Cedar Creek	- - -

Mt. Pleasant

Coal Fork Canyon

- - -

Manti - There were extremely heavy showers in the north end of Sanpete County. Cloudbursts in Manti Canyon brought three floods to the city. Powerplant ditch damaged and the road was covered in many places with mud and boulders several feet deep. (2/)

Spring City - "This city received a heavy downpour of rain followed by a flood. It filled canals and irrigation ditches to overflowing. Several gardens and yards were covered with debris and refuse." (8/)

Mt. Pleasant - Flood described as "medium." (7/)

1934 July 27

Spring City

Cedar Creek

- - -

Manti

Manti Creek

- - -

Mayfield

Twelve Mile

- - -

These floods were all described as "light." (7/) At Spring City the powerplant dam was washed out. (4/)

1934 August 6

Monroe

Monroe Canyon

500 c.f.s. (1/)

"The city is without culinary water and power today as a result of a flood in Monroe Canyon last Monday (2 days ago). The fields south of town were covered by floodwaters, rocks, and other debris. Damage was estimated at several thousand dollars." (8/)

1934 August 8

Richfield

Willow Creek

- - -

Junction

City Creek

- - -

Richfield - The road in the canyon was badly washed. One wagon and team was overtaken with the floodwaters and lost. The occupants of the wagon had a narrow escape. (2/)

Junction - A flood Wednesday afternoon rushed in upon the city. (2/)

1934 August 14

Monroe	Monroe Canyon	- - -
	Sand Canyon	300 c.f.s. (1/)
Panguitch		- - -

Monroe - Floods out of the canyon Tuesday afternoon caused heavy damage to the pipeline that was just replaced following a similar flood ten days before. This time 200 feet washed out compared to 60 feet before. More of the road was washed out in the canyon. Farms south of town received an additional covering of mud and debris. (8/)

Panguitch - The heaviest rainstorm of the season brought a terrific flood from the foothills. (5/)

1934 August 19

Richfield	Cottonwood	950 c.f.s. (1/)
	Flat Canyon	- - -

A heavy rainstorm occurred late Sunday afternoon. The flood out of Flat Canyon west of town filled Sevier Valley Canal with sand and debris. A flood out of Cottonwood Canyon filled the streets in the northern part of town and damaged fields with mud and debris.

1934 (Exact Date Unknown)

Ephraim	Axe-Handle Creek	200 c.f.s. (1/)
Oak City	Oak Creek	150 c.f.s. (1/)

Axe-Handle damages were estimated at \$380 and \$140 at Oak City. (1/)

1935 June 10

Sevier	Clear Creek	208 c.f.s. (6/)
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1935 September 2

Oak City	Local Runoff	400 c.f.s. (1/)
	Oak Creek	1,000 c.f.s. (1/)

Damages estimated at \$13,180. ^(1/)

1935 (Exact Date Unknown)

Monroe	Sand Canyon	800 c.f.s. ^(1/)
	Bertlesen Wash	500 c.f.s. ^(1/)
Antimony	Local Runoff	50 c.f.s. ^(1/)
Fountain Green	Tids Canyon	300 c.f.s. ^(1/)

Damages were estimated as follows: Monroe \$2,510; Antimony \$20; Fountain Green \$1,480. ^(1/)

1936 June 10

Sevier	Clear Creek	170 c.f.s. ^(6/)
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1936 July 11

Circleville	Sevier River	- - -
Marysvale	Sevier River	- - -
Panguitch	Panguitch Creek	- - -
Richfield	Cottonwood	750 c.f.s. ^(1/)

At Circleville and Marysvale the floods were described as light. ^(7/)
At Panguitch moderate. ^(7/) Damages at Richfield were estimated at \$1,310. ^(1/)

1936 July 22

Kingston	East Fork, Sevier River	646 c.f.s. ^(6/)
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1936 July 28

Ephraim	Ephraim Creek	700 c.f.s. ^(1/)
Manti	Manti Creek	- - -
Sterling	Six Mile Creek ^(7/)	- - -

Ephraim - Workmen labored all night to repair a broken pipeline at the new powerplant. As a precautionary measure against such disasters the pipeline was buried eight feet under ground. Despite this the flood swept it out. "A bridge at Blue Bell Flat eleven miles up the canyon was washed out marooning cars for four hours." (8/)

Manti - Bridges washed out. More than three feet of water washed along Main Street. Basements were filled. (8/)

1936 July 31

Richfield	Cottonwood	125 c.f.s. (8/)
	West Canyons	- - -
Sigurd		- - -
Glenwood		- - -
Manti	Manti Creek	- - -
Mt. Pleasant	Pleasant Creek	2,500 c.f.s. (1/)
Fountain Green	Cedar Hills (7/)	- - -
Panguitch	Panguitch Creek (7/)	- - -
Scipio	Round Valley Creek	- - -
Ephraim	Axe Handle Creek	300 c.f.s. (1/)

Richfield - A sudden cloudburst caused several floods from nearby canyons and considerable damage was reported. The Sevier Valley Canal was filled with sand and boulders, and it was estimated that several days work by a 40-man crew would be required to restore the canal. Between 100 and 125 second feet of water came down Cottonwood Creek. A great deal of damage was done to the crops in the Richfield area. Grain, sugar beets, and alfalfa were all damaged. (8/)

Manti - "Tons of mud and silt were washed into Manti in a flood which totally surprised the residents. Basements were filled with mud and debris." (8/)

Axe Handle - Damages were estimated at \$1,200. (1/)

Fountain Green - Damages were estimated at \$2,500. (1/)

Mt. Pleasant - City water mains were washed out, dividing dams in irrigation ditches were destroyed, Haystacks and crops damaged. (2/) Damages were estimated at \$22,960. (1/)

Scipio, Glenwood, Sigurd - Roads were closed by flooding and washing and there was considerable damage to crops. (2/)

1936 August 31

Oak City	Oak Creek	500 c.f.s. (1/)
	Local Runoff	250 c.f.s. (1/)
Ephraim	Ephraim Creek	900 c.f.s. (1/)

Oak City - A heavy cloudburst and battering hailstones struck fruit and farm crops. Roads were blocked by debris. (2/) Damages were estimated at \$4,300. (1/)

Ephraim - One of the heaviest storms occurred in the history of the town. Ephraim has had three severe storms in the past two days. (2/) Damages were estimated at \$9,600. (1/)

1937 May 19

Sevier	Clear Creek	263 c.f.s. (6/)
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1937 July 7

Ephraim	Axe Handle Creek	600 c.f.s. (1/)
Moroni	Peach Canyon	- - -
Wales	Wales Canyon	- - -

Damages from Axe Handle were estimated \$500. (1/) Other floods were classed as "severe." (7/)

1937

Richfield	Cottonwood Creek	800 c.f.s. (1/)
Antimony	Dry Wash	1,100 c.f.s. (1/)
Oak City	Local Runoff	300 c.f.s. (1/)

Salina	Salina Creek	750 c.f.s. (<u>1/</u>)
Monroe	Monroe Creek (<u>4/</u>)	- - -
	Sand Canyon	500 c.f.s.

Damages were estimated, as follows: Richfield \$1,300; Antimony \$1,300; Oak City \$840; Monkey Town \$7,920; Salina \$2,920; Monroe \$1,080. (1/)

1938 March 4

Aurora	Sevier River (<u>7/</u>)	- - -
Kingston	Sevier River	3,000 c.f.s. (<u>6/</u>)
Hatch	Sevier River (<u>4/</u>)	- - -

1938 May 27

Sevier	Clear Creek	314 c.f.s. (<u>6/</u>)
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1938 July

Sevier	Clear Creek	500 c.f.s. (<u>1/</u>)
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Damages estimated at \$1,750. (1/)

1938 (Exact Date Unknown)

Monroe	Sand Canyon	400 c.f.s. (<u>1/</u>)
Oak City	Local Runoff	200 c.f.s. (<u>1/</u>)
	Oak Creek	200 c.f.s. (<u>1/</u>)
Richfield	Cottonwood	1,000 c.f.s. (<u>1/</u>)

Damages were estimated, as follows: Monroe \$370; Oak City \$380; Richfield, \$3,690. (1/)

1938 September 6

Ephraim	Axe Handle Creek	1,100 c.f.s. (<u>1/</u>)
Aurora	Denmark Wash	1,030 c.f.s. (<u>1/</u>)

Damage from the Axe Handle flood was estimated at \$3,650 and at Aurora \$320. (1/)

1939 September 7

Kingston	Sevier River	1,000 c.f.s. (<u>6/</u>)
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1939 (Exact Dates Unknown)

Monroe	Bertlesen Wash	700 c.f.s. (<u>1/</u>)
	Monroe Creek	1,400 c.f.s. (<u>1/</u>)
	Sand Canyon	1,190 c.f.s. (<u>1/</u>)
Richfield	Cottonwood Creek	870 c.f.s. (<u>1/</u>)
Antimony	Local Runoff	70 c.f.s. (<u>1/</u>)

Damages were estimated, as follows: Monroe \$17,720; Richfield \$1,700; Antimony \$70. (1/)

1940 (Exact Date Unknown)

Richfield	Cottonwood Creek	500 c.f.s. (<u>1/</u>)
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Damages estimated at \$660. (1/)

1940 April 24

Sevier	Clear Creek	170 c.f.s. (<u>6/</u>)
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1941 May 12

Kingston	East Fork, Sevier River	2,030 c.f.s. (<u>6/</u>)
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1941 May 14

Hatch	Sevier River	1,140 c.f.s. (<u>6/</u>)
Kingston	Sevier River	1,260 c.f.s. (<u>6/</u>)

1941 July 25

Mt. Pleasant	Pleasant Creek	1,500 c.f.s. (<u>1/</u>)
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1941 August 5

Antimony	Antimony Creek	420 c.f.s. (<u>1</u> /)
	Dry Wash	1,100 c.f.s. (<u>1</u> /)

Damages estimated at \$1,580. (1/)

1941 August 6

Richfield	Flat Canyon	2,500 c.f.s. (<u>1</u> /)
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Damages estimated at \$500. (1/)

1941 August 7

Sevier	Clear Creek	847 c.f.s. (<u>6</u> /)
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One mile of stream channel was badly eroded. (4/)

1941 August 10

Marysvale	Cottonwood Creek	950 c.f.s. (<u>1</u> /)
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1942 May 11

Kingston	East Fork, Sevier River	625 c.f.s. (<u>6</u> /)
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1942 May 27

Sevier	Clear Creek	275 c.f.s. (<u>6</u> /)
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1943 July 31 (August 5?)

Monroe	Sand Creek	650 c.f.s. (<u>1</u> /)
	Bertlesen Wash	155 c.f.s. (<u>1</u> /)
	Monroe Creek	2,380 c.f.s. (<u>1</u> /)

On August 5, a local thunderstorm caused an estimated \$120,000 damage from flash floods near Monroe.^(9/) Monroe City was without water or electricity for two weeks. Pipeline, sewer systems, powerplant, and streets were damaged. Homes and the high school were flooded. Mud, rocks, and debris covered 115 acres of cropland.^(4/)



Monroe Canyon - Rock and debris completely obliterated the road. Picture is believed to have been taken of the 1943 flood. (Forest Service photo).



Monroe Canyon as it looks in 1968. Note the location of the white square area on the left canyon wall in both this photo and the previous one. (Forest Service photo).

1943 August 6

Salina	Salina Creek	715 c.f.s. (<u>1</u> /)
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1943 August 7

Salina	Salina Creek	804 c.f.s. (<u>6</u> /)
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1943 August 8

Kingston	Sevier River	1,040 c.f.s. (<u>6</u> /)
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1943 August 10

Sevier	Clear Creek	180 c.f.s.
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1943 (Exact Date Unknown)

Richfield	Cottonwood Creek	700 c.f.s. (<u>1</u> /)
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1944 May 10

Sevier	Clear Creek	281 c.f.s. (<u>6</u> /)
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1944 May 15

Salina	Salina Creek	697 c.f.s. (<u>6</u> /)
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1944 May 16

Kingston	East Fork, Sevier River	1,190 c.f.s. (<u>6</u> /)
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1944 (Exact Date Unknown)

Richfield	Cottonwood Creek	650 c.f.s. (<u>1</u> /)
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1944 August 8

Annabella	Local Runoff	800 c.f.s. (<u>1</u> /)
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1944 August 18

Salina	Salina Creek	350 c.f.s. (<u>1</u> /)
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1945 May 4

Sevier	Clear Creek	329 c.f.s. (<u>6</u> /)
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1945 May 14

Salina	Salina Creek	742 c.f.s. (<u>6</u> /)
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1945 (Prior to July 20)

Ephraim	Ephraim Creek	- - -
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"A few yards were coated over with flood mud, a number of streets were gullied or smeared over by thick muddy water, and culverts and the more level ditches were clogged by a medium-sized flood which came down Ephraim Canyon Thursday afternoon." (10/)

1945 August 1

Salina	Salina Creek	140 c.f.s. (<u>1</u> /)
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1945 August 2

Salina	Salina Creek	655 c.f.s. (6/)
Sevier	Clear Creek	245 c.f.s. (6/)

Salina - Most destructive flood in 25 years. Highway severely damaged with a considerable loss of productive topsoil. (4/)

1945 August 3

Salina	Salina Creek	320 c.f.s. (1/)
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1945 (Exact Date Unknown)

Milburn	Birch Creek (4/)	- - -
Monroe	Thompson Creek (4/)	- - -
Panguitch	3 Mile Creek (4/)	- - -

Monroe - \$25,000 estimated damage to canals, farms, crops, and the turkey plant. (4/)

Panguitch - \$1,010 damages estimated. (1/)

1946 July 24

Mt. Pleasant	Pleasant Creek	7,000 c.f.s. (1/)
		2,060 c.f.s. (6/)
Sevier	Clear Creek	185 c.f.s. (1/)

Mt. Pleasant - This was the most destructive flood to occur in the basin. It well illustrates what can happen in our modern towns in the basin if conditions again duplicate these at Mt. Pleasant on this fateful day. Debris buried the streets, mud filled homes, and ruined furniture. Merchandise in stores was ruined, livestock was lost, waterlines washed out. Fences, outbuildings, farm equipment, and other improvements were destroyed. Topsoil was removed from valuable grazing lands and washed into the valley. Total damages were estimated at \$106,199. (4/) The following three photos show the aftermath of the flood.



Debris from the July 24, 1946, flood at Mt. Pleasant. Note the mud line on the light post and sign giving an indication of flood depths. (Forest Service photo)



July 24, 1946, Mt. Pleasant flood. Below town flood debris covered a large area of farmland. (Forest Service photo)



July 24, 1946, Mt. Pleasant flood. Note the bunting and flags. The flood occurred during the town's Pioneer Day celebration. (Forest Service photo)

1946 August 2

Sevier	Clear Creek	245 c.f.s. (<u>1</u> /)
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1946 August 15

Sevier	Clear Creek	230 c.f.s. (<u>1</u> /)
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Salina	Salina Creek	230 c.f.s. (<u>1</u> /)
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1946 August 20

Salina	Salina Creek	200 c.f.s. (<u>1</u> /)
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1946 August 22

Richfield	Cottonwood Creek	135 c.f.s. (<u>1</u> /)
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Fountain Green	Spring Creek	- - -
	Big Hollow	1,000-1,500 c.f.s. (<u>14/</u>)
Axtell	Willow Creek	220 c.f.s. (<u>1/</u>)
Ephraim	Axe-Handle	100 c.f.s. (<u>1/</u>)

Damages at Fountain Green were estimated at \$1,410. (4/) Cropland in grain, hay, and sugar beets on 200 to 300 acres were inundated. Floodwaters contained little sediment and debris. (14/)

1946 August 23

Antimony	Antimony Creek	100 c.f.s. (<u>1/</u>)
	Dry Wash	200 c.f.s. (<u>1/</u>)

1946 (Exact Date Unknown)

Sigurd	Red Canyon (<u>1/</u>)	- - -
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1947 May 12

Sevier	Clear Creek	237 c.f.s. (<u>6/</u>)
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1947 August 20

Salina	Salina Creek	756 c.f.s. (<u>6/</u>)
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1947 (Exact Date Unknown)

Monroe	Monroe Creek	- - -
	Thompson Creek	- - -

A flash flood damaged canals and the upper tier of farms along the Monroe-Annabella highway. (4/)

1948 April 18

Sevier	Clear Creek	400 c.f.s. (<u>6/</u>)
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1949 May 30

Hatch	Sevier River	568 c.f.s. (6/)
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1949 June 11

Hatch	Sevier River	1,060 c.f.s. (6/)
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1951 July 21

Panguitch	Panguitch Creek	- - -
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Bridges and canals were washed out from a flash flood. (9/)

1951 (Exact Date Unknown)

Fountain Green	Log Canyon	- - -
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Mt. Pleasant	North Creek	- - -
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A small mud rock flow came down Log Canyon, deposited debris at the mouth of the canyon, and filled irrigation ditches with mud. (4/)

"The tops of the ridges and the accessible bottoms are depleted of palatable vegetation until many of them support only tarweed, stickweed, knotweed, and other nearly worthless plants." Mud was left on the tree trunks near the stream channel higher than a man could reach. Deposits of six to eight feet deep were left where the gradient was two to three percent. Roads, irrigation structures, fences, and ditches were all damaged. Part of the load reached the San Pitch River where two or three loads of legal size trout had just been planted. The muddy water suffocated the fish. Boys were gathering them from the sides of the river in sacks. Damage estimated at about \$6,900. (4/)

North Creek - A flood and mud rock flow six to nine feet deep scattered mud and debris over a wide area. (4/)

1952 May 3

Salina	Salina Creek	856 c.f.s. (6/)
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1952 May 5

Sevier	Clear Creek	337 c.f.s. (6/)
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1952 (Spring)

North Sanpete - - -

Piute County - - -

North Sanpete - Damages from rapid spring runoff were estimated at \$27,500. This included erosion of cropland, loss of diversion structures in the San Pitch River, damage to livestock feed and damage to irrigation systems and developments. (14/)

Piute County - Wet mantle floods from rapid snowmelt caused widespread damage in the Piute County area. Damages are estimated at about \$500,000. There is little detailed information available. (14/)

1952 June 5

Gunnison San Pitch River 1,330 c.f.s. (6/)

1952 July 31

Mt. Pleasant Birch Creek - - -

North Creek - - -

Birch Creek - The area where the flood originated is very steep, much of it approaching a 100 percent slope. (4/)

1953 July 7

Kingston East Fork, Sevier River 920 c.f.s. (6/)

Salina Salina Creek 2,650 c.f.s. (6/)

Logs and debris swept the bridge out by the Wasatch Cafe. The Salina Feed and Supply lost a small amount of hay. Backyards were flooded. (4/)

1953 July 15

Sevier Clear Creek 2,828 c.f.s. (6/)

1953 July 31

Panguitch Red Canyon 1,050 c.f.s. (14/)

Casto Canyon - - -

1953 (Exact Date Unknown)

Monroe Sand Canyon - - -

Damage resulted to the canal, high school buildings, and the east street of Monroe.

1954 May 20

Hatch Duck Creek 140 c.f.s. (6/)

1954 May 22

Sevier Clear Creek 156 c.f.s. (6/)

1954 (Exact Date Unknown)

Monroe Monroe Creek - - -

Damage resulted to the diversion canal, the road, and other improvements. (4/)

1954 July 17

Glenwood Mill Canyon 500 c.f.s. (14/)

Boulders weighing about 300 pounds were dropped along the channel in town. Damage was estimated at three to four thousand dollars. Lots and gardens were flooded, city and State roads, and cultivated crops were damaged.

A later revised estimate of damage made by the Soil Conservation Service was \$22,000. District Forest Ranger Haycock estimated damages on National Forest lands at \$750. (14/)

1954 July 25

Richfield Willow Creek 600 c.f.s. (14/)

A cloudburst in the upper reaches of Willow Creek brought considerable damage to the Peterson farm located below the Piute Canal north of Richfield. About 30 acres of hay and grain were flooded. (14/)

1955 July 17

Marysvale Beaver Creek - - -

Five feet of mud was deposited on the highway at Marysvale halting traffic for about four hours. (9/)

1955 August 6 and 7

Sanpete and Sevier Counties

Flash flood damage occurred. (9/)

1955 August 10

Mt. Pleasant	Pleasant Creek	- - -
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The water content of the flow was estimated by the flood investigator as only about 10 percent. The flood carried a heavy load of large boulders, tree trunks, rock and debris. Much topsoil was lost. One bridge was destroyed and short stretches of the road were damaged. The effectiveness of the splitter dams was reduced. (4/)

1955 August 16

Mt. Pleasant	Pleasant Creek	445 c.f.s. (6/)
	North Creek	- - -
Johns Valley	Cottonwood Creek	- - -

From North Creek the flood was a thick mud-rock flow. Some cropland was covered by heavy mud. (4/)

Cottonwood Creek flooded, closing the road for three weeks. Reconstruction of the road was required from Cottonwood station to Widsoe. A great deal of topsoil was lost from the watershed. (4/)

1955 August 17

Sevier	Clear Creek	611 c.f.s. (6/)
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1955 August 25

Manti	Manti Creek	1,000 c.f.s. (14/)
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Irrigation company canals along the base of the hills were filled with silt. Damage to the irrigation developments and city was estimated at \$2,300. (14/)

1955 August 26

Fountain Green

West Canyons

- - -

A flood occurred near Fountain Green causing damage to agricultural lands and other facilities. (4/)

1956 July 12

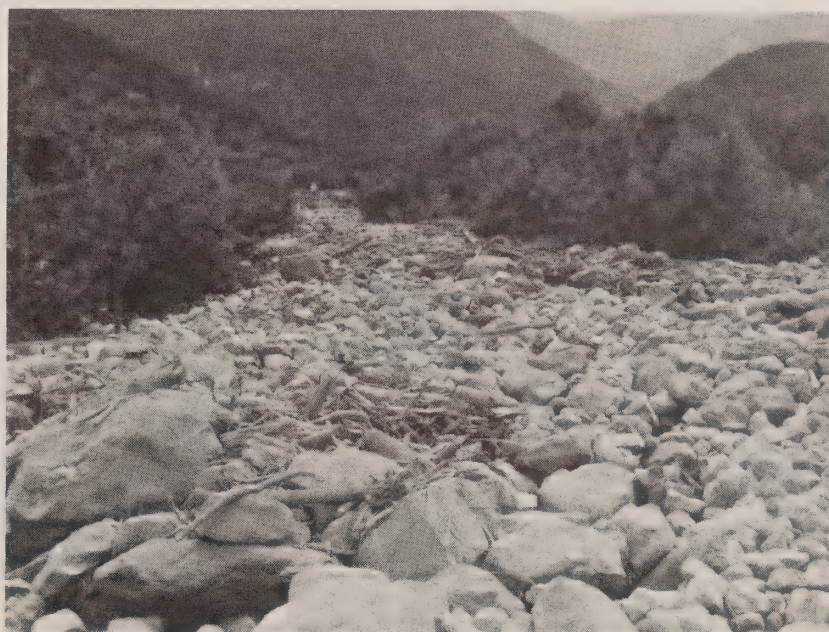
Between Manti and Ephraim Willow Creek

- - -

A flood cut the creek channel three feet deeper and deposited silt on cultivated fields below. Irrigation dividers were destroyed. (4/)



Hayfield covered by Willow Creek floodwaters July 12, 1956. (Forest Service photo)



Boulders deposited at the mouth of Willow Creek as a result of the July 12, 1956, flood. (Forest Service photo)

1957 June 5

Sevier	Clear Creek	484 c.f.s. (6/)
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1957 June 6

Hatch	Duck Creek	156 c.f.s. (6/)
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1957 June 11

Hatch	Sevier River	626 c.f.s. (6/)
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1957 June 26

Mt. Pleasant	Twin Creeks	117 c.f.s. (6/)
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1957 July 17

Marysvale	Dry Creek	- - -
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A mud rock flow closed the road. (4/)

1957 August 11

Kingston	East Fork, Sevier River	854 c.f.s. (6/)
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1957 August 25

Mt. Pleasant	Twin Creeks	113 c.f.s. (6/)
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1957 (Exact Date Unknown)

Monroe	Monroe Creek	- - -
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Heavy damage resulted to canals, Monroe Canyon road, culinary pipeline, the water supply to the powerplant and diversion structures. Mud and debris were deposited on the flood fan at the mouth of Monroe Canyon. Floodwaters damaged farms along the Sevier River. (4/)

1958 March 21

Hatch	Sevier River	546 c.f.s. (6/)
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1958 May 9

Antimony	Antimony Creek	331 c.f.s. (6/)
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1958 May 22

Kingston	East Fork, Sevier River	581 c.f.s. (6/)
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1958 May 24

Sevier	Clear Creek	301 c.f.s. (6/)
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1958 May 27

Mt. Pleasant	Pleasant Creek	209 c.f.s. (6/)
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1958 May 29

Hatch	Sevier River	833 c.f.s. (6/)
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1958 June 6

Hatch	Midway Creek	153 c.f.s. (6/)
Mt. Pleasant	Twin Creeks	111 c.f.s.

1958 August 25

Scipio	Ivie Creek	200 c.f.s. (14/)
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Damages were estimated to be \$2,500 to \$3,000 on croplands and to highway 63. Highway 63 was covered in several locations with mud and debris resulting in some minor traffic accidents. (14/)

1958 August (Exact Date Unknown)

Marysvale	Cottonwood Creek	- - -
	Bullion Canyon	- - -
	Revenue Gulch	- - -
	Beaver Creek	- - -

A great deal of soil was lost from the upper watersheds. Stream channels were badly eroded. Roads, irrigation canals, and homes were damaged, debris up to 12 inches thick was deposited on yards and lawns. Clean up costs were estimated at \$5,000. (4/)

1958 (Exact Date Unknown)

Monroe	Thompson Creek	- - -
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Mud and rock deposited on farmland below the alluvial fan. (4/)

1959 July 31

Sterling	Six Mile Creek	820 c.f.s. (6/)
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1959 August 3

Antimony	Antimony Creek	669 c.f.s. (6/)
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1960 April 28

Panguitch	Red Canyon	50 c.f.s. (<u>6/</u>)
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1960 May 15

Sterling	Six Mile Creek	185 c.f.s. (<u>6/</u>)
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1960 July 31

Monroe	Bertlesen Canyon	400 c.f.s. (<u>4/</u>)
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	Sand Canyon	100 c.f.s. (<u>4/</u>)
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	Dugway Canyon	60 c.f.s. (<u>4/</u>)
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Minor damages. (4/)

1960 September 5

Glenwood	Mill Canyon	3,620 c.f.s. (<u>14/</u>)
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Flood damage within the National Forest was minor. Large boulders were deposited below the watershed. (4/)

This storm exceeded in intensity many of the previous storms in the area but was largely contained within the flood retarding structure built in 1957. Six acres of meadow pasture were lightly coated with silt. Above the structures, roads sustained heavy damages. 35,102 cubic yards of sediment were deposited within the retarding structure. Severe gully erosion took place over a four-mile square area. The Soil Conservation Service estimated that the retarding structure prevented an estimated \$80,000 damage to the town of Glenwood. Actual damages largely from silt were \$1,250. (14/)

1961 May 1

Antimony	Antimony Creek	388 c.f.s. (<u>6/</u>)
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1961 May 20

Sevier	Clear Creek	110 c.f.s. (<u>6/</u>)
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1961 July 25

Levan	Chicken Creek	1,000 c.f.s. (<u>14/</u>)
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A picture taken of a cedar post-net wire retarding structure built in the 1930's by local people. This structure is upstream $\frac{1}{4}$ mile from the present debris basin. The date of the photo is unknown. The photo is taken looking upstream from a higher camera point than the photo below. Note the wire on the large cedar post in both photos.



Photo taken at the same location as the above photo following the 1960 flood. Photo is again taken upstream from down in the gully eliminating the exposure of background in the previous photo. Note the tremendous soil loss. (Soil Conservation Service photo)

Major gullying took place in the headwaters and the stream channel was greatly enlarged. Sediment damage was estimated at \$2,700 and flood-water damage, \$2,000. (14/)

1961 July 31

Oak City	Oak Creek	- - -
Richfield	Willow Creek	1,300 c.f.s. (14/)
	Cottonwood Creek	2,000 c.f.s. (14/)

Oak City - The road was washed out in two places. (14/)

1961 August 2

Richfield	Willow Creek	1,300 c.f.s. (14/)
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1961 August 2-9

John's Valley	Cottonwood Creek	- - -
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Cottonwood road damaged, severe channel cutting and erosion on the watershed. (14/)

1961 August 3

Levan	Chicken Creek	- - -
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A flood occurred from a high intensity rainstorm that passed across the head of Reese Valley in the Chicken Creek drainage above the town of Levan. The stream channel which normally carried one-tenth of a second foot of water, at this time of year, carried floodwaters eight feet deep and fourteen feet wide. Productive topsoil was lost from the head of Chicken Creek and new gullies were cut. The Chicken Creek channel was deepened and fish destroyed. Irrigation diversion structures and canals were filled with sediment and debris. (4/)

1961 August 5

Fountain Green	Tids Canyon	- - -
	Log Canyon	- - -
Fairview	Birch Creek	- - -

Moroni	Pole Canyon	- - -
Wales	Maple Canyon	- - -
	Wales Canyon	- - -

Fountain Green fish hatchery was covered with sediment. The fish habitat was affected but the fish were not killed. Eighty acres of irrigated cropland and 360 acres of dry farmland were covered with mud and debris. Three and one-half miles of ditches were damaged. Trees were uprooted and stream channels severely eroded. Large areas of bare soil at the head of Tids Canyon were factors contributing the heavy runoff. Estimated damage was \$31,500. (4/)

1961 August 11

Richfield	Cottonwood Creek	- - -
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This flood did several hundred dollars property damage in the northeast corner of Richfield and at the Richfield packing company one-half mile east. Severe erosion occurred in the upper watershed area and all channels were deepened a considerable extent. (14/)

Damages from the week of flooding were estimated by the Soil Conservation Service to be \$3,767. (14/)

1961 August 23

Sevier	Clear Creek	- - -
Scipio	Willow Creek	- - -

Clear Creek - Highway 13 was severely damaged between the old Bradbury Ranch eastward to Clear Creek Narrows, a distance of about five miles. (4/)

Scipio - National Forest lands were severely eroded. Some roads were flooded. Logs and debris made travel impossible. (4/)

1961 August 25

Fountain Green	Log Canyon	- - -
Mt. Pleasant	Pleasant Creek	200 c.f.s. (6/)
		3,310 c.f.s. (14/)



Harry Woodward, SCS Economist, estimates the cost of debris removal from this flood channel. Plugging of the channel at this point caused damage to adjacent fields, ditches, and roads. (1961 August 11 flood.) (Soil Conservation Service photo)



This service station at the northeast corner of Richfield was closed until mud and debris could be cleaned up. (August 11, 1961, flood.) (Soil Conservation Service photo)

A flood in Log Canyon resulting from a high intensity summer storm caused considerable damage. (4/)

Pleasant Creek flood originated from South Coal Fork. (14/)

1961 September 1

Antimony	Deep Creek	- - -
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A flood in the north fork of Deep Creek caused damage to the road. (4/)

1962 February 9

Sevier	Clear Creek	233 c.f.s. (6/)
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1962 February 12

Hatch	Sevier River	989 c.f.s. (6/)
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1962 March 27

Hatch	Sevier River	798 c.f.s. (6/)
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1962 March 28

Circleville	Sevier River	1,260 c.f.s. (6/)
Kingston	Sevier River	1,180 c.f.s. (6/)

1962 May 7

Hatch	Midway Creek	114 c.f.s. (6/)
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1962 May

Levan	Pigeon Creek	100 c.f.s. (14/)
	Chicken Creek	150 c.f.s. (14/)

Sediment damages were estimated at \$5,077.44. (14/)

1962 June 29

Panguitch	Red Canyon	95 c.f.s. (6/)
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1962 June 30

Sterling	Six Mile Creek	220 c.f.s. (6/)
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1963 May 3

Antimony	Antimony Creek	259 c.f.s. (6/)
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1963 June 18

Salina	Salina Creek (Soldier Canyon)	- - -
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Sediment and debris was deposited in the lowlands. (4/)

1963 August 2

Sevier	Clear Creek	170 c.f.s. (6/)
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1963 August 3

Monroe	Thompson Creek	- - -
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Flood damage was minor to private property but Thompson Creek was greatly eroded. (4/)

1963 August 9

Marysvale	Dry Creek	- - -
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Six miles of road and one mile of stream channel was badly damaged. Damages were estimated at \$900. (4/)

1963 September 5

Levan	Chicken Creek	- - -
	Deep Creek	- - -

A high intensity summer storm occurred in Chicken Creek. About 60 acres of National Forest land was severely eroded. The channel was deepened and changed its course in some places. Much of the road was damaged. (4/)

In Deep Creek, severe erosion took place on National Forest and private lands in the headwaters. Sediment and debris was deposited on the road. (4/)

1963 September 22

Fountain Green	Log Canyon	- - -
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A small flood was produced in Log Canyon. Damages were limited to the loss of topsoil and the deepening of gullies and stream channels. (4/)

1964 July 14

Panguitch	North Fork, Shearing Corral Wash	112 c.f.s. (14/)
	South Fork, Shearing Corral Wash	214 c.f.s. (14/)
	Three Mile Creek	140 c.f.s. (14/)

An intense cloudburst hit the Panguitch area on July 14 lasting about two hours. The runoff from Shearing Corral Wash overflowed its banks, doing damage to several areas of County-maintained roads. Three reservoirs were filled on the James Dodd property. Three basements were flooded in town. Floodwater damages were estimated at \$1,300 and \$1,150 from sediment. The west Panguitch Canal washed out in three different places.

1964 July 31

Antimony	Dry Wash	300 c.f.s. (14/)
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Damage from floodwater was estimated at \$2,825 and from sediment \$3,500. Alfalfa on 28 acres was lost. An irrigation flume across the wash was swept away causing crops serviced by the flume to be without water for two weeks.

1964 August 15

Antimony	Pole Canyon	- - -
	Wash and Kings Hollow	- - -
Aurora	Lost Creek	- - -

Antimony - Land, crops, and roads were badly damaged. (4/)

Aurora - "The Upper Lost Creek Canal suffered sedimentation damage as the flash flow from denuded hillsides carried sediment into the canal at three locations causing the lower bank to break." Canal flow was interrupted for ten days. The storm was widespread from Glenwood to Salina. Gullying and rilling were extensive in the headwaters. (14/)

1965 July 19

Ephraim	Ephraim Creek (New Canyon)	- - -
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Two and one half miles of the New Canyon road was closed to traffic because of washing and debris on the road. Precipitation recorded at the Oaks gage in Ephraim Canyon was 0.30 inch in a ten-minute period beginning 1615 hours. (4/)

1965 July 31

Wales	Wales Canyon	400 c.f.s. (14/)
Mt. Pleasant	Pleasant Creek	800-1,000 c.f.s. (14/)

Mt. Pleasant - This flood filled the debris basin and partially plugged the outlet works, limiting outflow to about 30 c.f.s. It was estimated that as much as 80 percent of the flow was solid matter. The flood originated on the Blue Slide area of Blue Slide Fork. Boulders the size of a small room were carried by the stream. (14/)

1965 August 3

Johns Valley	Sweetwater	- - -
	South Creek	- - -
	Pine Creek	- - -

Some road was damaged. (4/)

1965 August 9

Angle	Pole Canyon	- - -
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Pole Canyon road was damaged for about one mile by accumulated rocks and silt and one mile of creek channel was badly washed and deepened. (4/)

1965 August 17

Glenwood		- - -
Annabella	Twist Canyon	1,000 c.f.s.

Damages amounting to \$18,000 were estimated after a rainstorm poured forth $2\frac{1}{2}$ inches of water in less than an hour on the low hills between Annabella and Glenwood. Heaviest damage was to county road and bridges. Some roads were completely destroyed and others severely washed and were covered by mud and debris. Some crops were destroyed, basements flooded, and other damage done. The stream of water at Annabella was described as 56 feet wide with an estimated flow of 1,000 c.f.s. At Glenwood, water ran through the streets over a foot deep. (11/)

1965 September 5

Hatch

Asay Creek

- - -

Water was running over U. S. 89 causing traffic to be slowed to a snail's pace. About 200 acres of grass hay was destroyed. Damages were estimated as \$3,600 from floodwater and \$1,300 from sediment. (14/)

1967 July 23

Richfield

Flat Canyon

900 c.f.s.

(14/)

Twelve acres of alfalfa were severely damaged along with 1.6 miles of road, a bridge abutment, and a canal. Damages were estimated at \$1,275. (14/)

1967 August 6

Kingston

Kingston Canyon

- - -

The source of the flood was low elevation rocky slopes with scanty vegetation. State Highway 22 was severely damaged for 1-3/4 miles and some people were temporarily stranded. Irrigation diversions and systems were damaged. Total damages were estimated at \$2,150. Some irrigation systems were without water for over a week. (14/)

SOURCES OF FLOOD DATA

- (1/) Sevier Lake Watershed Report Appendix No. 4 Watershed Appraisal published by USDA in 1950.
- (2/) Notes from the Deseret News published in "Utilization of Surface Water Resources of Sevier Lake, Utah" by Ralf R. Wooley, USGS Water Supply Paper 920.
- (3/) Notes from annual Climatological Data of the United States Weather Bureau published in "Utilization of Surface Water Resources of Sevier Lake, Utah" by Ralf R. Wooley, USGS Water Supply Paper 920.
- (4/) Notes from U. S. Forest Service Flood Reports collected by T. Carl Haycock and Max R. Keetch, Forest Service River Basin Representatives.
- (5/) "Cloudburst Floods in Utah, 1850-1938" by Ralf R. Wooley, USGS Water Supply Paper 994 (obtained from miscellaneous newspapers).
- (6/) "Magnitude and Frequency of Floods in the United States" Part 10 of the Great Basin USGS Water Supply Paper 1684.
- (7/) "Floods on Streams in Utah, 1850-1938." A 1941 Unpublished Report of the Intermountain Forest and Range Experiment Station, U. S. Forest Service.
- (8/) Notes taken directly from the Deseret News, formerly "The Deseret Weekly News" and the "Deseret Evening News." Published at Salt Lake City, Utah.
- (9/) Notes taken directly from "Climatological Data for Utah" United States Weather Bureau.
- (10/) Notes taken directly from the "Ephraim Enterprise" weekly newspaper published at Ephraim.
- (11/) Notes taken directly from "Richfield Reaper" weekly newspaper published at Richfield, Utah.
- (12/) "Range Preservation and its Relation to Erosion Control on Western Grazing Lands" by Sampson, Arthur W., Weyl, Leon N., June 25, 1918. USDA Bulletin No. 675.
- (13/) "Taming the Turbulent Sevier: A Story of Mormon Desert Conquest" by Leonard J. Arrington. The Western Humanities Review, Volume 5, No. 4. Published by the University of Utah.
- (14/) Information from Soil Conservation Service Files, Salt Lake City, Utah.

